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L. 136 NO. 24 JUNE 13 1959 Price 1s. Weekly

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IN ITS 75th YEAR

June 13 1959

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NOTES of the WEEK

Plastics Exhibition

ALTHOUGH there have been four previous British Plastics Exhibitions and Conventions, the exhibition opening at Olympia on June 17 (until June 27) is the first International Plastics Exhibition and Convention to be held in London. As such, the scope and content of this biennial event has significantly increased. This was, of course, inevitable in any case as a truly remarkable degree of progress has been made in the plastics industry in the UK, the USA and Continental Europe during the past two years. Some of the changes that have taken place or are in progress, such as in methods and techniques of processing plastics materials, have been fundamental. Notable among these is the development of high speed, fully automatic injection moulding machines of relatively small capacity, which find particular use in turning out thin-walled containers. A number of manufacturers will be exhibiting machines of this type at Olympia and their performance, especially when compared to that of large machines using multi-impression moulds, and development will be followed with interest. In the two years since the last exhibition, again with the aim of speeding the moulding cycle, and thus production, considerable advances have been made in preplasticizer machinery and techniques. In machinery, the trend is clearly towards the screw type machine, either single or twin screw, as the most efficient present aid to larger stress-free mouldings and faster cycle times. Other desirables in the constant fight for higher speeds and lower costs are the reduction of packing in the moulds, and the avoidance of excessive high pressures, both of which can be achieved by the incorporation of two-stage preplasticization.

Machine Trends

AMONG the extrusion machines, single and twin screw designs, there is again visible the trend towards larger machines with higher production speeds and in many cases bigger diameter screws, while the greater interest presently discernible in the production of filaments, besides the extrusion of film and sheet, will be reflected in the equipment to be shown in this field. The use of extruders for the compounding and mixing of raw materials is also to be demonstrated and it is understood that at least one company will be exhibiting machines for an increasingly popular manufacturing field, that of extrusion blow moulding. Special purpose compression moulding machines, mostly fully automatic, and an entirely new slush moulding machine will be among others that will attract attention. Improved techniques and changes in the design and construction of vacuum forming machines, in line with new ideas as to their potential—not only in the packaging field but also in the forming of larger sections—will be exhibited on a number of stands. Part of the fascination of the ever-expanding plastics industry lies in the tremendous range of its fabrication and associated processes, most aspects of which will be covered at Olympia. For instance, there will be demonstrations of heat sealing and high frequency welding including impulse welding and the use of rollers. Here again the accent will be on faster operations as, indeed, it will be in the examples of new techniques and applications in reinforced plastics where the amount of time and labour involved must somehow be cut down.

Materials Side

ON the material side a number of notable developments are to be seen. Particular interest will no doubt be aroused by the polyamides such as nylon type 6 and type 11 and the high viscosity nylon 66. Acrylics, in particular the fine powder forms now available for extrusion and moulding, are bound to attract attention in view of the increasing interest in the potentialities of this material. Polythene in all its grades is exhibited by a record number of manufactures in densities from 0.91 to 0.96. The many forms of polystyrene, including foams, are prominent; other foams include PVC and polyester and polyether urethanes. PVC is also shown in its high impact form and a new copolymer sheet recently introduced for vacuum forming. Interesting, too, are the PVC-nitrile rubber blends and the ABS materials.

Two-way Research

ONE of the points emphasized by Mr D. B. Collett, chairman of council, Research Association of British Rubber Manufacturers, at the Association's annual general meeting last week, was that research is essentially a two-way business. When one thinks about it, it is clear that for the fullest advantage to be taken of the extensive services available, members should go to Shawbury to complement the visits made to member firms by research technical staff. In that way, the technical staff must become more fully informed of the industry's current problems and, as Mr Collett said, better placed to make a real impact on the developments which are taking place.

we are exhibiting
international
plastics
exhibition
olympia 17-27 June

VISITORS are welcome to Rubber Journal and International Plastics' stand at the International Plastics Exhibition. We are on Stand 410 on the first floor of the National Hall.

NEWS *Briefs*

PLASTICS IN HAWAII—POLYCARBONATE PLANT FOR US GEC—MALAYAN PLANTING—BRAZILIAN RUBBER IMPORTS — DOW POLYTHENE PLANT

●**Hawaii**—The Pacific Chemical and Fertilizer Company of Honolulu, and the Dow Chemical Company, Midland, Michigan, have announced the formation of a company to manufacture polythene plastic film and film products in Hawaii. The new concern is named Hawaiian Extruders Incorporated.

●**Malaya** — The wage agreement signed by the Malayan Planting Industries Employers' Association and the National Union of Plantation Workers last February has now come into effect. Rubber tappers get a guaranteed wage, and extra payments for the average poundage of latex brought in by them from the trees. The Employers' Association and the Union said the agreement had been implemented on 671 estates, covering an area of 1,547,903 acres.

●**United States**—The Senate Appropriations Committee is not now expected to make recommendations for rotating strategic materials in the US stockpile.

●**Italy**—The Ceat Company of Turin and the Goodyear Tyre and Rubber Company have signed an agreement for the manufacture of Goodyear pnuematic tyres in Italy. Truck tyres are the principal item in the production schedule. Production will start this year.

●**United States** — General Electric Company announces a multi-million pound polycarbonate plant to be constructed near Mount Vernon, Indiana. Dr A. E. Schubert, general manager of the Chemical Materials Department of GE, said that production of the new plastic material, called Lexan, can be anticipated for the latter part of 1960.

●**United Kingdom**—Rubber manufacturers are included in the list of goods which Britain is freeing from import control from the dollar area with effect from June 8, according to a Board of Trade announcement.

●**France** — The French Government will shortly issue a decree granting additional tax facilities for manufacturers buying capital goods. Under the move, aimed at boosting French equipment industries, those buying French capital goods between now and January 1 1960 will be allowed to make a 10% cut in their tax declarations in the form of 'accelerated amortization.' The rubber industry is included in a list of industries to which this move will apply.

●**Brazil**—The Indonesian newspaper *Economic Journal* reports that the Indonesian Government has rejected the Brazilian Government's plan to buy rubber from Indonesia, because the term of payment was to have been made with Willys' jeeps instead of foreign currency. The newspaper added that the jeeps were from the US and would have been assembled in Brazil.

●**Malaya**—Large amounts of rubber planting material were given to smallholders for new projects and replanting schemes in the first quarter of this year, a Ministry of Agriculture report said on May 27. The amount of budwood was 52,000yd. and clonal seedling stumps totalled 800,000.

●**United States**—The Dow Chemical Company has doubled its polythene plastic capacity for the second time in a year with the completion of a new plant at Freeport, Texas, the company announces. The new capacity was not disclosed, but industry sources estimated it at about 100m. lb. of low and intermediate density polythene per year. The company also announced it has started building another polythene plant near Plaquemine, Louisiana.

●**United States**—Reichhold Chemicals Inc., on May 28 put 'on stream' the first phase of its new synthetic resin plant here. Initial production is of polyester resins, principally for the reinforced plastics industry, and alkyd resins, used in the manufacture of surface coatings.

●**Indonesia** — Indonesian Foreign Minister Subandrio has stated that, in exchange for Indonesian rubber and tin, Brazil could supply rice, textiles and other consumer goods to Indonesia.

●**Argentina** — The United States Rubber Co., New York, will invest US $50,000 in its subsidiary US Rubber International SACI, Argentina, in the form of moulds for the production of rubber tyres.

●**Philippines**—The Ysmael Steel corporation, the Philippines' only integrated appliance manufacturing concern, opened a new subsidiary plastics plant in Quezon City. The inauguration ceremonies were headed by President Carlos P. Garcia. The new plant is designed to produce plastic parts for the numerous Ysmael products and other allied industries.

●**Argentina** — Société Internationale Pirelli SA, Basle, and the United States Rubber Co., New York, are to invest US $650,000 in the affiliate of the former company, Compania Platense de Neumáticos SIAC, Argentina, in machinery and equipment for increasing the output of tyres.

—443

Plastics at Work

PLASTIC VALVES AND TAPS — THE MACLOW DIAPHRAGM VALVE

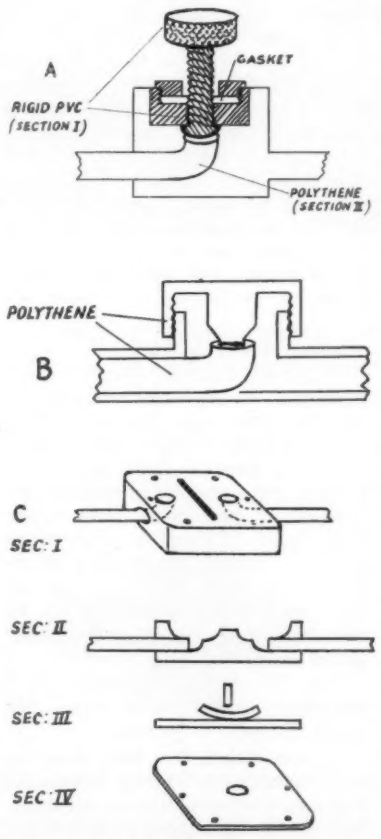
By DAVID ALEXANDER

EVER since polythene and PVC tubing were first used commercially for the conveyance of corrosive liquors, etc., the problem of designing suitable means of stopping the flow of liquor using a valve of similar material to the line, has existed. Much has been done, of course, and there are a number of different valves already on the market, but it would be reasonable to say that as yet there is no high pressure valve available that has not one or other drawback.

The first valves produced some years ago were of Continental design and made from rigid PVC. These were to some degree satisfactory and used the same basic principle as shown in Fig. A. The big fault, however, was that in pressure pipe lines there was the possibility of gland leak, also the danger of fracture through impact. Another big factor in plastic valve design that has not been overcome is where the average workman turning a valve on or off expects the same type of feel that he is used to with an all-metal valve. Due to the mechanical properties of thermoplastics it is not possible to do this, yet the operator very often continues to tighten up the valve waiting for a sudden and firm seating action to take place. As this cannot usually be felt in a plastic valve the result is that the threads are stripped in the spindle or the seating split or otherwise damaged.

More recently since the introduction of high density polythene to the market it has been possible to give greater strength to components and certainly to use this material in place of PVC giving a valve less likely to impact fracture or similar damage. It has never been satisfactory to make a complete low density polythene valve as the material does not lend itself to continuous use when threaded. Much trouble seems to arise from the use of most of the present standard polythene valves and taps. The difficulty of running polythene on polythene has been overcome by one producer of plastic valves with the use of rigid PVC inserts wherever there are moving parts, with the added advantage of having a hard material seating on a softer material. Section I of Fig. A shows the hard material and section II shows the softer. The advantage of this can be seen over the type of valve shown in Fig. B where both threads are polythene and can easily bind or stick. However, the problem of gland leak still exists especially in high pressure lines, *e.g.*, 25 psi and above. Even below this pressure with the design shown in Fig. B leakage can be expected. From this drawing another difficulty can be seen and that is when the spindle is tightened down the natural action is to push out the valve seat, and as there is no sudden stop to warn the operator, the valve seat can very easily be split.

From this it can be seen that the main problems are not in the seating, which can easily be strengthened, but in the spindle arrangements along which most acid or liquor leaks occur. Logically it is reasonable to expect alternative arrangements to be considered in order to eliminate this flaw. This has been done by the use of a diaphragm which has sufficient flexibility to permit an 'open and close' action to take place. In Fig. C is shown the principle of this type of valve, section I is the base, section II a side view of the same base, section III the diaphragm and section IV the top cover, which is bolted to the housing.



Section 1 of Fig. A shows hard material in the valve; Section 2 the softer. In Fig. B, both threads are of polythene and can bind. Fig. C shows the use of a diaphragm to permit open and closed action

As can be seen, the valve consists of two separate chambers with no point at which liquor can leak up a spindle, the diaphragm separating the mechanical action of the spindle from the opening and closing of the valve. With this type of arrangement it is possible to operate at higher pressures without leak problems. In time, fatigue stresses affect the polythene diaphragm and therefore replacement is necessary, but usually at a very low cost and giving the surety during its life of efficient working. The only possible drawback to this type of system is the cost of producing the valve, which will preclude its use for many purposes.

An arrangement or design which would seem to provide the answer to the various comments so far made, is one where the spindle end which seats on the valve seat, is incorporated with the diaphragm providing a useful single unit covering the requirements of a very wide market.

New Valve Design

It is therefore opportune that a new valve (in ¼in. bore so far) has become commercially available, which seems to cover many of these requirements, namely the Maclow valve which is being put on the market by K.W. Chemicals Ltd.

From Fig. D, which is an exploded view of the valve, it can be seen that it consists of four parts, top and second top parts being made from high density polythene and the third part made from ordinary polythene in order to retain the necessary flexibility, and the housing is made from

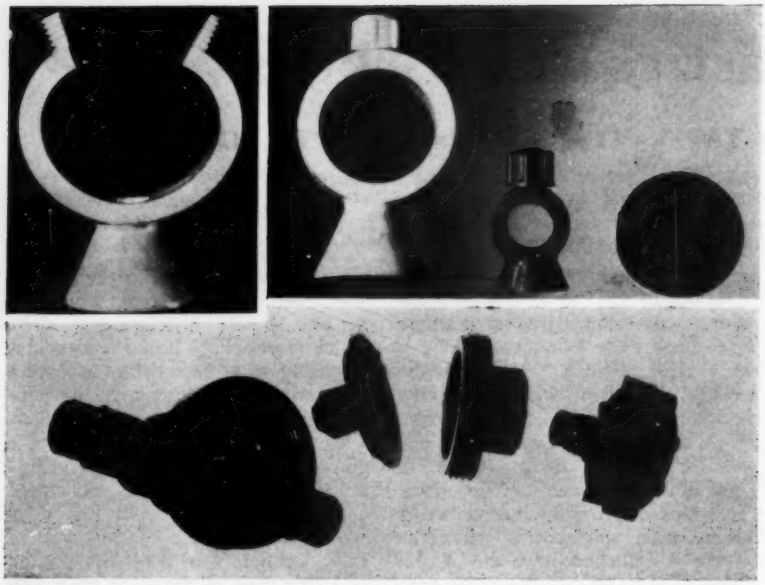


Fig. D, lower picture, shows an exploded view of a new valve made from high density polythene and ordinary polythene. The valve has reportedly operated at 60 psi without difficulty. The top picture shows plastics pipe holder bands also described in the text

HD polythene with the pipe connexions available alternatively in either HD or ordinary polythene. An interesting point here is that the pipe stubs are welded in after the housing has been injection moulded, allowing for various alternative types of connexion to be fitted such as threaded as shown, plain ends, bibcock ends, and flanged ends.

Looking more closely at the diaphragm it can be seen how the flexibility has been preserved by cutting down the wall thickness between the centre pin and the outside which retains a good thickness, the outer perimeter being so designed to give an effective seal between both the housing and the diaphragm and between the diaphragm and the retaining plate.

No Seat Split

The illustration shows the strength of the housing and the valve seat by which design the problem of seat split has been almost completely overcome. The valve handle and screw has a coarse thread which helps to give a fairly speedy shutting and opening action, this thread being in high density and the retaining plate thread also in high density material so that the turning movement is free. Assembly of the valve is obviously easy therefore allowing quick and easy replacement of the diaphragm when necessary.

The valve has apparently been operated at up to 60 psi without difficulty but no doubt this should be tested by practical experiment before allowing the valve to be put to production use. The company which is putting this valve on the market is now working on a polypropylene diaphragm which will allow effective use of the valve at higher temperatures. The second stage of this development programme is to consider the manufacture of whole valve in this material allowing an even higher range than the combination of polypropylene and high density polythene.

Maclow Holder Bands

Whilst the Maclow valve was being developed it was felt advisable to develop at the same time some form of holder which could be used to effect easy installation of these valves. As a result of this another interesting new example of plastics at work is the holder band. This novel idea (patent pending) reduces the number of retaining screws to one and by the use of a split thread allows pipe to be installed easily and subsequently locked into position.

Fig. D shows: A holder band assembled; and a holder band split before the pipe is inserted.

Various claims have been made for the holder band among which are that it is cheaper than brass and therefore can be considered as an alternative if necessary; it is unbreakable, non-corrosive; requires no painting and reduces water hammer noises; and in the case of plastic pipe expands at the same rate as the pipe.

The band is available from ¾in. to 2in. to suit both copper and polythene tube to the British Standard specifications. At the same time a further range is available to use with PVC rigid tubing. The latest development is a 3in. band and it is subsequently hoped to extend this range even further particularly by the use of polypropylene which will give the additional strength necessary to hold 6in. and larger pipe.

The main applications for the holder band are for installations where the pipe work is subject to corrosion and in the electrical field where PVC conduit is in use, and also for the installation of rigid PVC pipe work in chemical factories where frequently corrosion is as extensive externally as internally. In the smaller sizes the bands are used for laboratory work for pilot plant pipe line assemblies where again corrosion is very often taking place externally.

From reports available from the suppliers it is claimed that already this Maclow holder band has evoked very great interest on the market as there is no unit of this type at present available.

PI Western Section

Recently, thirty members of the Western Section of the Plastics Institute and their ladies, enjoyed their annual outing. After lunch at the ancient George and Pilgrims Inn at Glastonbury the party were conducted around the shoe factory of C. and J. Clark at Street.

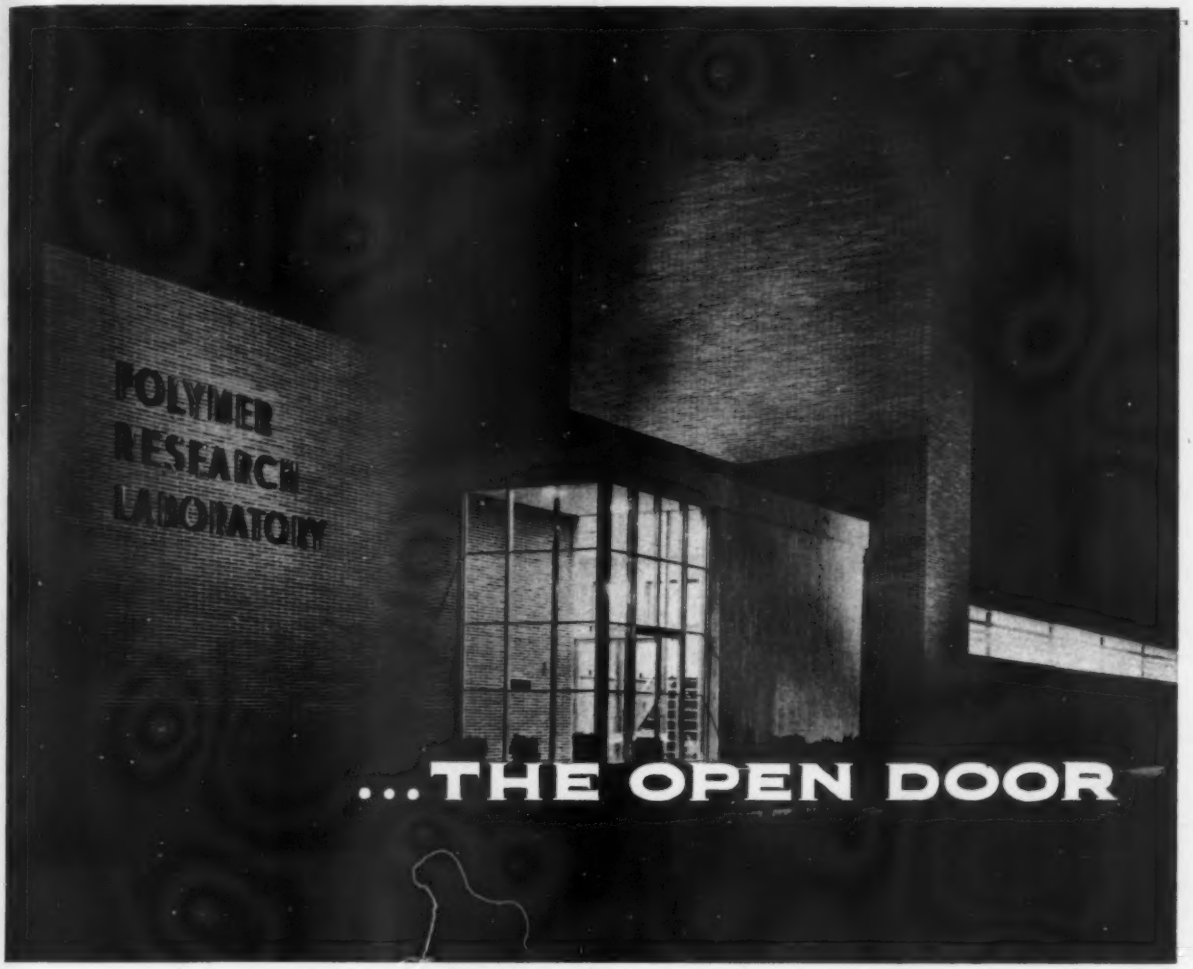
Every facility was given to small parties accompanied by a guide. Both the rubber processing division and the shoe making parts of the factory were visited and all counted it to be a most interesting tour.

After a tea provided by Clarks the party returned to the Erinoid Clubhouse, Lightpill, in order to hold the annual general meeting of the Section.

North British Appointments

The North British Rubber Company has announced additions to the sales staff for US Tredaire carpet underlay, introduced to the UK only a little over one year ago.

Mr S. Davies, who has been associated for many years with the furnishing industry, has taken over the Midlands and East Anglia territory, while Mr P. W. Hickinson, who has had considerable experience in the carpet trade in the North of England, will be responsible for sales development in that area.



The progress of the future depends on the research which is done today.

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Flexible Towed Container

FIRST DEEP SEA TRIAL OF 'DRACONE'

THE first deep-sea trials of the 'Dracone' flexible towed container have been successfully completed by the Heavy Organic Chemicals Division of Imperial Chemical Industries Ltd. and Dracone Developments Ltd.

Many of the petroleum chemicals which I.C.I.'s Heavy Organic Chemicals Division manufacturers and exports in large-tonnage shipments are lighter-than-water liquids capable of transportation in 'Dracone' containers — for instance, plasticizer alcohols, such as iso-octanol, and solvents, including acetone, isopropyl alcohol and isobutyl alcohol. The Division therefore arranged to ship a trial cargo of liquid hydrocarbons from its works at Billingham to Flushing, Holland.

'Dracone D.4,' which has a carrying capacity of 40 tons, was selected for the job. The skin, about 0.15in. thick, is of woven nylon fabric, proofed inside with oil-resistant acrylonitrile - butadiene rubber and outside with neoprene. *(Previous reference to 'Dracone' containers appeared in RJIP, September* 27 1958 *p.* 460.)

Loading from road tankers at the I.C.I. wharf at Billingham on the River Tees was accomplished without difficulty. 'Dracone D.4' was unwound from the reel on which it had been transported to Billingham by lorry, and filled through a pipe connexion as it lay on the water.

After a short and satisfactory experimental trial in the open sea, 'Dracone D.4,' towed by the ocean-going tug 'Fiery Cross' of Middlesbrough, sailed for Flushing. The 260-nautical mile voyage was completed at an average speed of 6.8 knots. So that I.C.I.'s shipping and technical experts could examine all phases of the handling, unloading was not carried out at Flushing, although this could readily have been done—but at Billingham.

The tug owners reported that, although the tug experienced a good deal of rough water, there were no serious problems and the tow-rope loading was far less than they had expected for a container of this size. The 'Dracone' towed throughout in a perfectly docile manner, without yawing or snatching.

The Heavy Organic Chemicals Division of I.C.I. intends to carry out further investigations into this novel method of exporting its products in bulk.

The 'Dracone D.4' embarks on its sea trial. The 260-nautical mile voyage was completed at an average speed of 6.8 knots

ASTM IN 1958

A summary of the 1958 activities of the American Society for Testing Materials was published in the January issue of the ASTM Bulletin. The summary states that 1958 output of standards on plastics was considerable. The Sub-Committee on Plastic Pipe, jointly sponsored by ASTM and the Society of the Plastics Industry, completed work on two significant test methods for plastic pipe covering a long-time hydrostatic pressure test (D 1598-58T), and a short-time rupture strength test (D 1599-58T). These tests were going to be very useful for reference in establishing working pressures for plastic pipe for various industrial and domestic piping applications.

Rubberlike plastics in cellular form were increasingly used in automotive seating, in furniture, and in various other applications where its shock-absorbing characteristics were useful. The two principal synthetic materials currently used for this purpose were the urethanes and polyvinyl chloride. These two materials in cellular form were subjects of specifications and test methods developed by Committee D-11 on Rubber in co-operation with the Society of the Plastics Industry and approved by the Society at the annual meeting. The committee had also selected certain definitions of terms from the 'Rubber Glossary' (STP 184) and other sources, and had established them as tentative definitions (D 1566).

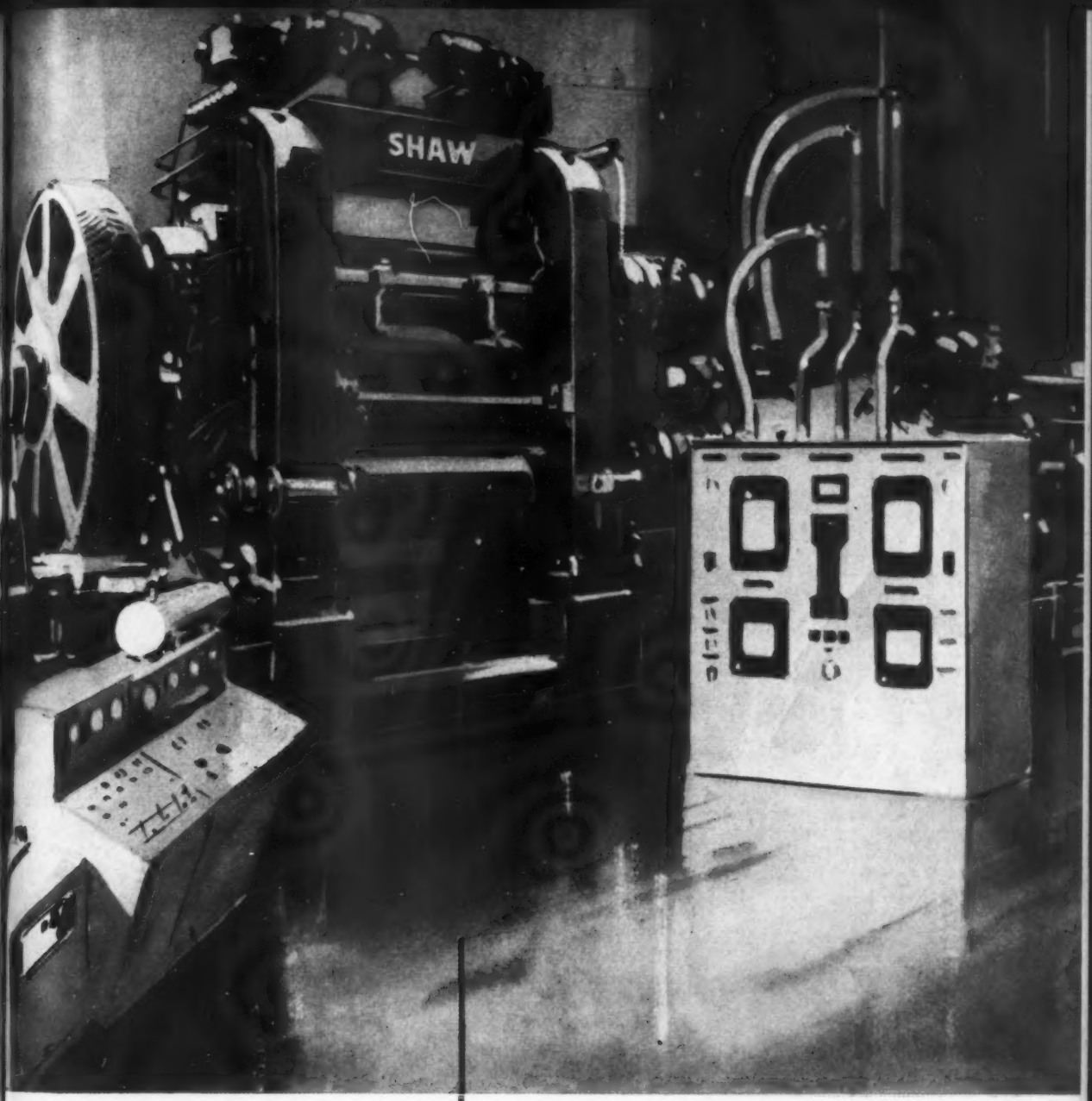
Foam Rubber Adhesive

A new adhesive (S.834) for the bonding of natural and synthetic foams, suitable for use in the upholstering of railway carriages, coaches and aeroplanes as well as the manufacture of mattresses, cushions and pillows, is now available from the Dunlop Rubber Company, Compositions Division. S.843 is a white adhesive comprising plasticized synthetic rubbers in a blend of non-toxic solvents, and gives a particularly strong and flexible bond.

Wallwork Cup Result

The Wallwork Cup was retained by Scotland in the match between IRI Golfing Society Sections at Hawkstone Park on June 8. The winner was again Mr T. W. W. Davie, of the North British Rubber Co. Ltd. A full report will appear in a later issue.

Owing to the fact that this issue has had to go to press early, it has not been possible to include rubber market reports of sufficiently late date to be useful.



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P.2307

Polypropylene and Polythene in Chromatography

NOVEL uses of polypropylene and polythene, described in a recent patent specification, are as sorption agents in the determination of the composition of a vapour containing organic compounds by partition chromatography. According to the patent (No. 813,855 by I.C.I.), isotactical polypropylene produced by the low-pressure polymerization process is the preferred sorption agent as its adsorption capacity is high, it can be readily desorbed, it exhibits little resistance to gaseous flow and no auxiliary solvent is required. By using this material as the sorption agent and nitrogen as the inert gas in a chromatographic apparatus, the following mixtures could be resolved clearly and sharply:

(a) Methanol, ethanol, isopropanol, n-propanol, isobutanol and n-butanol; (b) n-pentane, pentene-l, n-hexane, hexene-l and n-heptane; (c) heptenes from polymer gasoline; (d) nonenes from polymer gasoline; (e) benzene, toluene and xylenes; (f) cyclopentane, methylcyclopentane, cyclohexane and methylcyclohexane.

Resolution of mixtures (c) and (d) was at least as good as with the standard combination of di-nonyl phthalate on 'Celite' diatomaceous earth but there was no absolute separation. In the case of mixture (e), ortho-xylene was resolved from the other xylenes, but meta-xylene and para-xylene were not resolved from one another.

Polythene tested in a similar way was found to be capable of resolving mixtures (c), (e) and (f) but with considerably reduced retention time.

IRI Autumn Conference

The autumn conference, 1959, of the Institution of the Rubber Industry, on industrial technical organization, will be held at the Palace Hotel, Southport, on Friday and Saturday, October 9 and 10. Speakers will include: Reay M. Geddes, O.B.E. (Dunlop Rubber Co. Ltd.), J. G. Mackay, Ph.D., B.Sc., A.R.I.C., F.I.R.I. (Francis Shaw Ltd.); W. D. Scott, Ph.D., B.Sc., D.I.C., A.R.C.S., F.R.I.C., F.I.R.I (BTR Industries Ltd.). The programme will include two papers: 'The Internal Organization and Administration of a Technical Department,' and 'The Inter-Relation of Works, Technical Service and Sales Department.'

Full details of the Conference, together with hotel facilities available, will be circulated to IRI members at the end May or early June. Bookings for the Palace Hotel only, may be made through the Institution at the time of registering for the conference.

US Rubber Co. Earnings

The net income of the US Rubber Co. in the first quarter of this year was approximately 10,200,000 dollars, compared with 3,891,000 dollars in the corresponding period of 1958, Mr John W. McGovern, president, told the annual meeting recently. The net income was equivalent to 1.55 dollars a common share, compared with 45 cents in 1958. First quarter sales, Mr McGovern said, were approximately 249,000,000 dollars, compared with 196,000,000 dollars.

'Our first quarter volume,' he told stockholders, 'was stimulated by heavy customer buying in anticipation of a possible strike which unfortunately occurred on April 9, and profits were enhanced by the high volume of production which resulted in lower unit costs.' Some of this business was borrowed from the second quarter and US Rubber could not expect to continue at the first quarter level of sales and production, he added.

ASTM Standards

The American Society for Testing Materials has completed publication of its 10-Part '1958 Book of ASTM Standards.' Each part is complete with a detailed subject index and a list of standards in numeric sequence.

Part 9. Plastics, Electrical Insulation, Rubber, Carbon Black, 2,056 pp., 380 standards $14.00, covers electrical insulating materials, varnishes, tubing, tapes, sheet, rods, oils, askarels, porcelain, paper, mica, matting, asbestos yarns and roving; moulded materials; laminated thermosetting materials; vulcanized fibre sheets; enclosures and servicing units; plastics, allyls, phenolics, ureas, vinyls, cellulose, melamines, foams; rubber products, carbon black, fire hose, belting, gloves, matting tape, wire and cable, rubber-coated fabrics, cements, sponge rubber, hard rubber, brake hose, blankets, foam, automotive, synthetic elastomers.

The complete set is priced at $116.00. Copies may be ordered through *RJIP* Book Department.

EUROPEAN CHEMICAL MANUFACTURERS

The Austrian, Belgian, British, Dutch, French, German, Italian, Swedish and Swiss Chemical Manufacturers Associations have decided to improve their collaboration and contacts by setting up a Centre Europeen des Federations de l'Industrie Chimique (CEFIC) the secretarial services of which are entrusted to the Swiss Association in Zurich.

CEFIC is a working agency of the directors and will be responsible for organizing their meetings and for the exchange of information. Contact with the Centre will be solely through the directors of the member countries.

United Carbon Co.

United Carbon Company, whose principal offices have been located in Charleston, W. Va., since the formation of the company 35 years ago, shortly will begin the gradual transfer of its executive and departmental headquarters to other cities.

According to president R. W. French, United Carbon's executive offices will be moved to Houston, Texas; the marketing headquarters will shift to New York City; and remaining departmental headquarters will go to Houston. The Appalachian Area office of the company's gas and oil division will be retained in Charleston.

New Surface Coating Resin Index

A new 'Surface Coating Resin Index' has been prepared jointly by the Surface Coating Resin Section of the British Plastics Federation and the Surface Coating Synthetic Resin Manufacturers' Association.

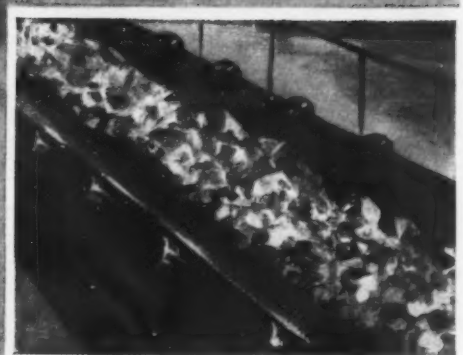
The booklet, which replaces a similar index published in 1955, aims at giving, under one cover, the basic information on all British-made surface coating synthetic resins at present available to the paint, printing ink and allied trades. Fifteen groups are covered and there is an index of trade names as well as the producers.

The Index is available on application to the British Plastics Federation, 47-48 Piccadilly, W.1, price 5s., post free.

Armour Hess Chemicals

Hess Products Ltd. and the Chemical Division of Armour Chemical Industries Ltd., have been merged under the name of Armour Hess Chemicals Ltd. Sales of industrial chemicals will continue to be made from 4 Chiswell Street, London, E.C.1.

Nonox ZA



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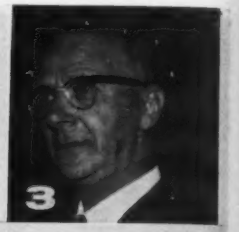
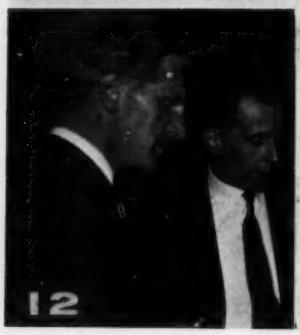
E

At the IRI Foundation Lecture and Dinner





Amongst those present at the IRI Foundation Lecture Dinner, which was held at the Cafe Royal, London, on May 29, were the following: 1. G. Martin, IRI Council Chairman (Anchor Chemical Co. Ltd.), M. W. Philpott and V. H. Wentworth; 2. E. A. Murphy and Dr C. M. Blow (Midland Silicones); 3. Dr R. J. Scott (RABRM); 4. Dr S. S. Pickles and Fred May (RJIP cartoonist); 5. Mrs G. Martin, Mr G. Martin, Lady Dean and Sir John Dean (Telegraph Construction and Maintenance Co. Ltd.); 6. Dr G. F. Bloomfield and R. C. W. Moakes; 7. J. M. Buist (I.C.I.), K. G. Burridge (ISR), J. H. C. Roberts (I.C.I.) and J. H. Simms (I.C.I.); 8. P. Wigley, R. H. Craven (IRI), C. H. J. Avons (Firestone Tyre and Rubber Co. Ltd.) and F. W. Ball (Dunlop Rubber Co. Ltd.); 9. E. W. Madge (Dunlop). 10. R. Laffoley; 11. A. F. W. Saunders, J. Buist and Dr Bielstein; 12. H. J. Hornsby and R. J. Mann (ISR); 13. H. A. Curren (R. W. Greeff and Co. Ltd.). 14. Dr C. M. Blow, S. D. Sutton (Veedip) and Mrs S. D. Sutton; 15. A. Cooper (Expanded Rubber)

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VIEWS and REVIEWS

Classified and Special NRs

IN an Editorial in the May 1959 issue of the *Planters' Bulletin* (published by the *Rubber Research Institute of Malaya*) the present position—and its implications—of the 'Classified' and 'Special' rubbers produced in Malaya are discussed in an interesting and, if I may say so, simple and able fashion. Thus, the first two lines of the editorial disclose a statistico/technical situation scarcely known or appreciated by very many, I imagine. These lines read:

'It is not perhaps generally realized that almost a quarter of Malaya's total output of rubber is sold to a technical specification.' It is explained that 'The major portion of this is latex concentrate whose production, following rapid expansion in the post-war period, reached a record level in 1958.'

Value of a Specification

The value of a practical and agreed specification may be gathered from the fact that, as the editor of *Planters' Bulletin* puts it: 'The specifications laid down at an early date for latex concentrate have ensured production of a high quality material which has necessarily been improved, during the last year or two, by the introduction into our latex factories of the standards of cleanliness adopted by the milk industry.'

TC Rubber and Tyres

Next in quantity to latex concentrate we come to 'technically classified rubber.' In this regard the position seems less satisfactory, for while 'it is true that the regular technical classification of a substantial quantity of No. 1 sheet is meeting the needs of some rubber users . . . we have been disappointed that producers have not found it worthwhile to classify the lower grades . . . so failing to meet the tyre manufacturer's contention that TC rubber is valueless unless the bulk of their purchases of lower grades is classified.'

SPR

Next in order we come to 'Superior processing rubbers' the advantages of which in improved processing characteristics have, so far as I am aware, not been subjected to adverse criticism. It seems to me to be worth pointing out that here again we start at the latex stage (as with 'specified' rubber), and that, as is pointed out in the *Planters' Bulletin*, all SP rubber is carefully tested for conformity to certain technical standards.

The rapid growth of SP—which now approaches 2,000 tons per annum—doubtless accounts for the fact that 'The introduction of superior processing properties into brown crepes is now under way and will give the user an opportunity to utilize an improved lower grade' and that 'we are also developing a concentrated form of SP rubber which can be mixed into any grade of rubber.'

Basis of Sale

It is noted in the *PB* editorial that all the rubbers discussed excepting TC and SP brown crepe are 'premium grade' materials which—and this is an important point in an overall discussion—'must necessarily cost more than the first quality latex from which they are made. It may be too early to give a definite view as to the cost increase due to the latex factor, but I am inclined to the view that as regards SP, and particularly the higher grade, the increase may not be beyond that attributable to improved value. With regard to TC, prophecy is more difficult.

Cost must, necessarily, ultimately be the basis of sale, but it is at least worth while to note that, in the present article, while it is agreed that there is a large proportion of rubber which is still sold according to the visual grading system, this, in time to come may be sold, not on its appearance, but 'on its technical properties.' That, of course, is not a new idea, but may be significant in its renewed appearance at the present time.

On the sale-by-quality view the *Planters' Bulletin* remarks:

(A) 'Already limits are set for the amount of copper and manganese that can be tolerated and suggestions have been made for inclusion of other specifications,' and

(B) 'We believe that additional technical requirements should not be grafted on to the existing grading system, but should be included in an all-embracing system of technical classification. The customer is always right; if the user wants to buy his rubber by technical specification the producer must find ways of fulfilling the demand.'

A 'Study' Unit

According to the article reviewed above, a small unit, which is an integral part of the BRPRA, has been set up in this country to study the technical requirements of British manufacturers through close contact with their factory managers and technologists. In this way it is hoped to establish a channel for technical communication between user and producer, and so to keep the user fully informed of new developments in NR.

Absolute Molecular Weight Method

Rubber Chemistry and Technology (1959, No. 1, vol. xxxii, 97 and 99) contains a reprint of two papers by F. Bueche and S. W. Harding (University of Wyoming). The first of these is entitled 'New Absolute Molecular Weight Method—Linear *High* Polymers,' and is reprinted from *J. Chemical Physics* (1957, *vol. 27* (5), 1210). In view of the later paper I will content myself by quoting the last paragraph of this short communication, which is: 'It is believed that the shear-rate molecular-weight method has great promise in those instances where its convenience is of primary importance. Once a solution is made, the molecular weight may be run in about an hour by even an inexperienced technician.' [The 'Acknowledgment' states that the work was supported by grants in aid of the National Science Foundation and from the Goodyear Tire and Rubber Co.]

The second paper by the same authors as that of the

COMMENT ON SCIENTIFIC AND INDUSTRIAL MATTERS

by **DR SCHIDROWITZ**

preceding one bears the title 'New Absolute Molecular Weight Method for Linear Polymers' (*i.e.*, as in the first paper except that the word 'High' is omitted, and has been italicized by the reviewer in the previous case). This second paper has been reprinted by *RCT* from *J. of Polymer Science* (1958, *Vol. 32*, pp. 177-186).

Previous Methods

In their introduction the authors point out that the absolute molecular weights of coiling polymers can be determined by several methods, and that two of these, namely osmotic pressure and light scattering, are now in widespread use. Both the said methods are well developed and give reliable molecular weights, 'provided adequate care is taken.' . . . 'Unfortunately, these methods require rather exacting measurements and one might wish in many cases to sacrifice accuracy to a certain extent if ease of measurement could be increased.'

Purpose of Paper

The purpose of the authors' (*second*) paper is to show that reasonably accurate values for *M.* can be obtained for linear coiling polymers by a relatively simple method. This is based on the determination of the viscosity of very concentrated polymer solutions—η—at various rates of shear, γ.

I must pass over sections on Theory and Experimental, but may point out that viscosities were determined by means of a cone viscometer of which there is a simple schematic diagram—Fig. 2, page 101, description in text. Details of this viscometer may, I think, be studied with profit by those interested.

Conclusions

According to the authors the shear rate method described for determining mol. weights is 'capable of giving reasonably accurate absolute molecular weights for linear coiling polymers,' and 'It is possible to obtain fairly accurate molecular weights for uncomplicated polymers with a rather small amount of effort and skill.'

As regards time—an important matter in many modern laboratories, 'Usually a technician can carry out the required measurements in an hour once the solution has been prepared. . . .' Moreover, the equipment need is comparatively simple, and 'there is a good possibility' that equipment could be further simplified by using a simple extrusion capillary viscometer.

Graft Polymers

The May 1959 issue of *Gummi und Asbest-Plastische Massen* (published by A. W. Gentner, Stuttgart) contains a useful review of 'Processes for the Production of Graft Polymers of NR' *(Die Verfahren zum Herstellen von gepfropftem Naturkautschuk)* by Dr L. Stadelmann. The author defines 'Propfpolymerisat' as corresponding to the English term 'Graft Polymer,' and meaning a uniform linear macromolecule bearing side-chains consisting of a different macromolecule, which seems to convey our meaning of the term quite nicely. The review terminates with a considerable number of references.

As the expressions 'Simple Polymer,' 'Random Copolymer,' 'Block Copolymer' and 'Graft Polymer' may still be the subject of some misunderstanding, I reproduce, herewith, an illustration from the *Proceedings of the Institution of the Rubber Industry* (1956, Vol. 3, No. 1, p. 29) and express my obligations to the authors (F. M. Merrett and R. I. Wood, British Rubber Producers' Research Association) of the paper in point, and to the Institution.

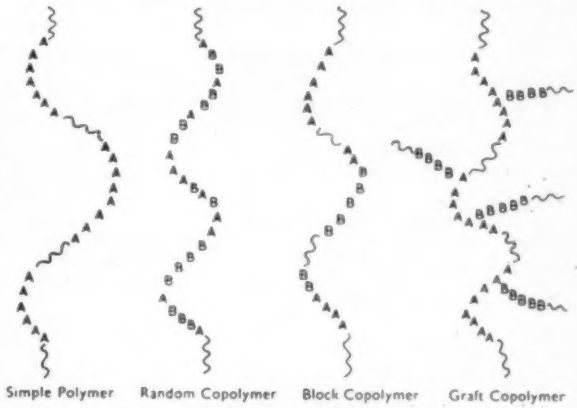

Fig. 1. Principal types of Polymers
(reproduced from IRI Proceedings)

'Kauchuk i Rezina'

The first issue of *Soviet Rubber Technology* (English Translation of Kauchuk i Rezina) lies before me. This cover-to-cover translation of the monthly Russian journal, an organ of the State Committee of the USSR Council of Ministers, as the heading on page 1 mentions, is, as Dr Watson, Director of Research, RABRM, holds, in its translated form a new major rubber journal in the English language.

The history of the establishment of the translations unit of RABRM within the framework of DSIR, and the necessity for the new enterprise will, no doubt, be written in full in due course—and Dr J. R. Scott's initiative in taking the first steps, and the persistence and courage of all those associated with the production and distribution, will doubtless be appreciated and recorded.

The importance from a practical, as well as from a purely scientific standpoint, is emphasized by the papers and articles in the first issue 'No. 1, June 1959,' which represents 'No. 1, Vol. 18' (January 1959) of the Russian original. Some half-dozen, at least of the said communications are (*e.g.*) of direct interest in connexion with tyres, and the celerity of translation and production are a feature which represents no mean accomplishment.

PHILIP SCHIDROWITZ

Vinyl Folding Doors

Folding doors made from vinyl are permanently pleated by a stiffening material held in heat-sealed pockets and travel silently on nylon runners in an overhead track. The doors, which are supplied by The Marley Tile Co., are made in four models and 16 standard sizes.

Questions Corner—76

(Second Series)

323. What methods are recommended for the mechanical testing of plastics?

324. What commercial applications are there for polymers made from pearl or bead polymerization?

325. In recipes for emulsion polymerization of different monomers emulsifying agents are used. What are they?

326. How does emulsion polymerization differ from bead or pearl polymerization?

(Answers next week)

Answers to Questions Corner—75

319. A collection of BS methods for determining the electrical properties of plastics is given in BS 2782: Pt. 2: 1957, and include the following:

Electris strength of moulding materials, flexible extrusion compounds, sheet, rod and tube. The methods are for measuring the electric strength in oil of test specimens prepared from moulding material, etc. Electric strength is defined as the maximum electric stress, in volts per mil., or the maximum voltage which a specimen will withstand without the occurrence of electrical failure by puncture of the specimen.

Volume resistivity, with and without guard rings, and determined from the current flowing through the material when a voltage is applied to the opposite faces of a sheet of the material.

Surface resistivity which is determined from the current flowing when a voltage is applied to electrodes on the surface of the material.

Power factor and permittivity at 50 c/s of moulding material, sheet and tube. The power factor at this frequency often has some correlation with its electric strength at power frequencies at the same temperature.

Power factor and permittivity at 800-1,600 c/s of moulding material, sheet and tube.

Power factor and permittivity at 10Kc. to 100 megacycles/s of moulding materials, sheet and tube. The apparatus developed by Hartshorn and Ward is used (see BS 2067).

320. The various methods used for studying the effect of temperature on plastics are collected together in BS 2782: Pt. 1: 1956 and include:

Crushing strength after heating (heat resistance) and includes two methods, the heating cycle being such as to differentiate between cellulose-filled and mineral - filled materials. Neither method is suitable for elastomeric or highly deformable materials.

Deformation at elevated temperatures which includes tests for plastic yield, deformation in bond under load, softening point (bending test) and Vicat SP (indentation) test.

Melting point in which may be determined the softening point (ring and ball method) or the melting point (capillary tube method).

Mechanical properties at low temperature. In this section the cold bend and cold flex temperatures of polyvinyl chloride extrusion compounds are determined. Also, the low temperature extensibility of elastomeric polyvinyl chloride sheet.

Flow properties are determined using the cup flow of phenolic and alkyd moulding materials, melt flow index of polythene and polythene compounds, and finally the flow temperature of thermoplastic moulding materials.

Shrinkage and after shrinkage, as well as loss in weight on heating. In this section the shrinkage of phenolic, aminoplastic moulding materials and after shrinkage of aminoplastic moulding materials, at various temperatures, is determined.

321. If one considers the many applications for decorative laminates this provides a clue as to the type of test required for these materials, *e.g.*, as table tops, sink tops and general applications in the kitchen, panelling, etc. The following tests are of particular value in this connexion:

Stain resistance.—Obviously a list of materials that might be expected to cause stains on table tops, etc., could be quite extensive but those of importance for everyday uses include water, acetone, fly sprays, soaps, detergents and washing powders, oils, tea, coffee. Resistance to inks may also, on occasion, be important. Any test in this class must necessarily be empirical but it is desirable to make two types of test: a. The reagent is left uncovered and allowed to evaporate, and, b. The reagent is covered with a watch glass to prevent evaporation. The results can be reported in terms of: a. No colour change or change in surface texture; b. easily removed by light abrasion; c. strains not easily removed.

Cigarette Burns Test.—This can be purely empirical or by the use of an electrical spot heating device, and noting the time taken to cause blistering, charring, etc.

High Temperature Test.—This test is desirable in the case of decorative laminates which may be subjected to high temperature at a local area such as may be encountered in the kitchen.

Boiling Water Test.—Again, this is a useful test for material subjected to boiling water over a local area, as in the kitchen. Heat a kettle of water and when boiling spill some of the water on to the laminate and then place the kettle in the pool of water. Allow to remain for 20-30 minutes, remove and dry the surface, and examine the surface for defects.

322. Some vinyl polymers which have polar substituents in the C-C chain molecules are insoluble in most solvents. On the other hand, the monomers are readily soluble. When these are polymerized in solution the polymer will separate as a flocculant precipitate which may be recovered in a finely divided form. This is known as precipitation polymerization.

Monomers which are suitable for this method include vinyl chloride, acrylonitrile, acrylic esters, vinylidene chloride and chlorofluoroethylene.

As an example, copolymerizing vinyl chloride and vinyl acetate from precipitating solvents has the advantage of producing copolymers of uniform composition, or nearly so, with quite high yields. A similar method may be used in the production of vinyl chloride with acrylonitrile for use in the spinning of fibres, in which a constant composition is required in order to secure the easy solubility of the copolymer in acetone (USP 2,064,565; 2,075,429; 2,420,330).

Polymers obtained by this process are relatively free from catalyst residues and low molecular weight fractions. They are also free of haze.

Polymers which are easily soluble can be prepared with high molecular weight using alcohol-water mixtures as the solvents (USP 2,121,839; 2,204,517).

The continuous polymerization of vinyl chloride and vinyl acetate in butane has been described (USP 2,075,429).

(More questions next week)

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MEN *and* MATTERS

A Review of People and Events

by George A. Greenwood

AS already very briefly recorded, the Federation of British Rubber and Allied Manufacturers have been choosing their new officers for the year 1959-60 and Mr H. G. W. Chichester-Miles is to succeed Mr Jasper Frankenburg, M.A., as president. This is an election which will please a great many people in the rubber industry. Mr Chichester-Miles was educated at Bedford, and served in the Royal Garrison Artillery during the first world war. Afterwards he was for some time a buyer and then a sales manager in the motor car industry, and on January 1 1924 he set up his own

Mr H. G. W. Chichester-Miles, who, as mentioned in *RJIP* last week, has been elected president of the Federation of British Rubber and Allied Manufacturers for 1959 - 60. Mr Chichester-Miles is chairman of the Empire Rubber Co. and of Rubber Bonders Ltd.

business in London as a manufacturers' agent. Then, in 1929, he founded and registered the Empire Rubber Company (H. C. Miles Ltd.), primarily as a sales organization with another rubber company, the object being to improve the knowledge and uses of rubber in the motor car industry. Nine years later a factory was set up at Dunstable to make and sell rubber components to the motor manufacturing industry and, looking back, it is interesting to recall that this was one of the first companies in Great Britain to undertake bonding rubber to metal.

The organization, which, I suppose, is now one of the best known of its kind in the country, has factories at Dunstable, at Clacton-on-Sea, and at Chichester, and it has also a part interest in a factory at Melbourne, Australia. Mr Chichester-Miles, who is a vice-chairman of RABRM where he has taken a particular interest in the finances of the Association, is a keen man of business, but his activities do not rest there. He is greatly interested in the Rotary movement, and a past district chairman, he is a Fellow of the Royal Philatelic Society, and a keen gardener.

The vice-presidents for the same term are Mr S. D. Sutton, in his case I understand a re-election, and Mr C. H. M. Baker of the Firestone Tyre and Rubber Co. Mr Sutton is equally well-known to us all as the honorary treasurer of the Institution of the Rubber Industry. Mr Baker is vice-chairman of the Materials Supply Committee of the TMC and the Federation, and was chairman of the sub-committee which produced the book on 'Natural Rubber Grades and Contracts' which has been particularly helpful in promoting the orderly marketing of rubber both in this country and abroad.

The Greatest Show . . .

Among the, to me, most fabulous machines on show at Olympia next week is one from Denmark shown for the first time in Europe and described as one of the fastest of its type in the world. What particularly intrigues me about it is that it blows bottles and containers in practically numberless variety and will also make all sorts of hollow plastic articles from toys to bowling balls for the new American style alleys soon to be opened here. It is also sufficiently versatile to do all this in many materials including nylon, PVC, acetate and polythene. It can be seen on stand 13.

One of the most interesting companies showing its wares is Chemische Werke Hüls. This German firm has grown very considerably over the past few years and now sells some 600 chemicals to the world's markets. Most of its turnover is in plastics raw materials such as PVC, polystyrene and high density polythene, soon to be joined by polypropylene. Its share capital is owned jointly by Chemieverwaltungs AG, 50%, Bergwerks Hibernia, 25% and Kohleverwertungs GmbH, 25%.

One of the interesting features of the works is that the 12½ miles of internal roads are raised 10 ft. above ground level owing to the high ground-water level; another is that the 25 miles of railway tracks are laid in one direction only, avoiding crossings, and connecting to the company-owned goods station which handles 1,000 wagons a day. Incidentally, the company now provides some 4,000 flats for its employees and staff and a very fine guest house was recently completed.

Notable on the Distillers' Group stand is a 12-screen continuous film display featuring 24 new colour films to illustrate the claim that 'Plastics Serve Everyone.' These films, which are to be shown on screens arranged in a double bank and specially placed to allow for good visibility for the maximum number of those who want to see them, will run non-stop and will describe the rapid progress of plastics in everything from domestic use to heavy industry and transport. That sounds rather like a tall order, but it merely illustrates the tremendous advances which we continue to make in the application of plastics to life. The range is wide enough to take in wearing apparel, records, wall covering, toys and, upon the industrial side, flame-resistant conveyor belting, ventilation ducting,

Mr J. M. Simon has been appointed general manager of the India Tyre and Rubber Co. in succession to Mr L. J. W. Bailey

electrical insulation and the application of plastics in passenger transportation vehicles.

It only remains for me to add that these films have been produced by Mr Freddie Squires, AIBP, ARPS, in conjunction with the publicity and information department of the Distillers Plastics Group. They have certainly done a good job of work.

Rotunda Retirement

Rotunda Ltd., Denton, Manchester, announce that Mr R. Hill, director and sales manager, retired from executive duties on May 31. He was presented with a television set by the management and staff to mark the occasion. Mr Hill, who will retain his seat on the board and will continue to assist the company in a consultative capacity, is succeeded as sales manager by Mr E. T. Mostyn, formerly Midlands representative.

Chess at the IPE

The wide use of melamine resins in decorative laminates, mouldings and surface coatings, will be displayed on the British Oxygen Chemicals Ltd. stand (413) at the International Plastics Exhibition. The emphasis of the display will be on the purity of the raw material melamine, and the high quality of products made from it. One of the highlights will be a chess set moulded in melamine which shows the high standard which can be achieved in such mouldings.

A series of chess problems will be set using the melamine chess-men and prizes will be given for the first correct solution to each problem opened. At the end of the exhibition all correct solutions will be eligible for another draw to decide the winner of the chess set.

Paintings, Too

Another interesting display will be seen on the stand of Commercial Plastics, whose foyer will be adorned by a selection of modern paintings from the collection amassed by Dr Pomeraniec, the company's managing director. They are all of them of the contemporary school of art and I believe that all of them are the work of British artists. These include such notable painters as Barker, Patrick Heron, Brian Winter, Alexander Mackenzie and Roger Fulton.

Good News

Meanwhile, all the commercial news about rubber is good news with two or three items especially spotlighted. For example, Sir Eric Macfadyen, chairman of Rubber Plantations Investment Trust, tells us that the net cost of its investments at March 31 was £1,802,320 and their valuation £2,415,728. That shows a surplus of £613,408, a wonderful jump. Then, Mr W. W. Halliday, presiding at the extraordinary meeting of Aberfoyle Plantations in London last Wednesday, said the company's present resources were such that there was every reason for distributing profits almost to the full at least for some time to come.

The British Oxygen Chemicals Ltd. melamine chess pieces

As for plastics, it will be remembered that I referred a few weeks ago to developments planned by Musical and Plastic Industries for entering the long-playing record market. These become effective next Monday (June 15) when a range of 50 recordings are to be offered at 16s. 9d. a disc, which I am told is less than half the price of similar types of recordings although it is claimed that they are equally effective. A statement by the company says that since entering the record market last October with a new low-priced extended playing 'Gala' disc, M. & P. have quadrupled output. There seems no doubt that a very good demand exists for these new long-playing products.

Our mutual friends of the Kleemann organization are also again in the financial news, offers being made to acquire the preference and ordinary shares of Erinoid not already held by Kleemann, at 9s. 6d. cash for each Erinoid 5s. ordinary share and £1 cash and three 6½% redeemable cumulative £1 preference shares of Kleemann for every four Erinoid 4½% redeemable cumulative £1 preference.

Monsanto Stand

The ground floor of the Monsanto Chemicals Ltd. stand at the 1959 International Plastics Exhibition will have a luminous suspended ceiling of 60 translucent plastic panels. The ceiling will cover 240 sq. ft.

The panels, vacuum-formed from 0.015in. Polyflex, give uniform glare-free illumination. They are light in weight, each panel is 2ft. square yet weighs less than 5oz., and are simple to install.

Polyflex is manufactured by the Plax Corporation of the United States and marketed in Britain by Monsanto Chemicals Ltd.

New BX Facilities

New facilities for BX Plastics Ltd. materials now available for local, ex stock deliveries. New depots in Birmingham, Manchester and Glasgow are now fully established with local transport arrangements which reduce by days the times for delivery normally quoted by leading manufacturers.

Addresses and telephone numbers of the new depots and offices are:

Manchester: Leestone Road, Wythenshawe, Manchester 22. 'Phone: Gatley 6731. Birmingham: Pensnett Trading Estate, Brierley Hill, Staffordshire. 'Phone: Kingswinford 3551. Glasgow: 40 Queen Mary Street, Bridgeton, Glasgow, S.W. 'Phone: Bridgeton 0010.

Now . . . you can be Shell-sure of styrene-butadiene rubbers . . . in 20 different types

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For further information consult your Shell Company (in the U.K., apply to Shell Chemical Company Limited).

Progress at Shawbury

RABRM ANNUAL GENERAL MEETING

THE annual general meeting of the Research Association of British Rubber Manufacturers was held at Shrewsbury on June 3. Mr P. W. Howard, president, was in the chair.

In his address to the members, a record number of whom were present, Mr D. B. Collett, chairman of council, referred to the changes of directorship which have taken place during the year under review. Their new director, Dr Watson, had got off to an excellent start after his appointment last November, since when a great many things had been done. Dr Scott, Dr Watson's predecessor as director, was continuing to help the Association as full-time scientific adviser. He had taken over editorship of the Bulletin and was also engaged in work on standards and in writing text books. It was hoped he would hold that position for some years to come.

Mr Collett went on to talk of the work put in on the Association's plans and case for DSIR grant terms for the years 1959 to 1963. Details had been printed in the Bulletin so that members could see and appreciate the essential nature of the steps taken. He mentioned the point deliberately, he said, because, looking back on the matter, 'It is quite evident that had we not gone forward with a bold and progressive policy and a great deal of faith in the future, it is not beyond the grounds of possibility that we might not at this time be benefiting from a DSIR grant.'

Subscription Rates

'This brings me,' continued Mr Collett, 'to the matter of subscriptions and I am glad to say that the response for the higher subscription rates for members has been gratifying. At the present time we are approaching the £65,000 mark which is the minimum needed to earn the DSIR grant for this year. We hope, of course, that before the year is out we shall approach the target of £80,000 and be able to secure the maximum benefit from the DSIR grant terms. In considering these higher subscription rates I would like to emphasize that your council is doing no more than the councils of similar research associations in this country are having to do in their own industries. As you will know the costs of scientific and highly-technical work have gone up in the same way as other things have gone up over recent years. I also don't want to pass on from this matter of subscriptions without mentioning that the council are fully conscious of the difficulties which the new minimum subscription is creating in some people's minds. The fact is, however, that £50 per annum was considered too low a figure in the light of present costs, and even the new minimum of £100 as a fixed charge, cannot be regarded as unreasonable for the kind of service which Shawbury is set up to provide.'

Mr Collett pointed out that the Association, now numbering over 250 members, had its services so arranged that in general each member can have the same kind of service, irrespective of size. Another point when considering subscriptions was that broadly speaking the cost of running Shawbury was shared, half by members' subscriptions, quarter from Government grant and quarter by staff efforts in the way of sales of publications, etc.

'One of the objectives of the council during the past year,' said Mr Collett, 'has been to improve the communications between members and Shawbury, and I was very interested to find that the records show the way this is developing. The visits from the technical staff to member organizations are three times higher than this time last year, and the visitors' book of members coming into Shawbury is a record in itself of increasing interest and desire to come and talk over problems with technicians on the laboratory floor at Shawbury. I am sure that that is going to be of considerable benefit to members because research in the way in which we visualize it today must be a two-way affair. It cannot be done just by the technical staff going out to members. To get the maximum benefit of our services members should come in as often as they feel necessary, and as a result of this our scientific staff will be better informed about the current problems of the industry and much better placed to make a real impact on the developments which are taking place.'

Special Courses

Mr Collett went on to mention the very great success of the special courses at Attingham Park, and added that a decision had already been made to arrange similar courses in the months ahead to meet such particular requirements as discussions with members might suggest.

The past year had also seen the issue of the first complete translation of a leading Russian technical journal, *Soviet Rubber Technology*, while another Shawbury 'first' was the development of the Shawbury Curometer* which they hoped would soon be followed by an interesting electronic tensile testing machine.

The list of achievements was a very long one and he did not intend to go into it all, but he did want to mention particularly Dr Wake's book on polymer analysis and Dr J. R. Scott's IRI Foundation Lecture. Mr Collett went on to say that RABRM was sending two representatives to the International Rubber Conference at Washington in November, when the Association would be represented by Dr J. R. Scott and Dr Wake, both of whom would be reading papers to the Conference. Then one of their new scientists, Dr J. Scanlan, had been invited to a very select conference arranged in the Mellon Institute, USA, next January; a feather in the cap of RABRM.

Work on Plastics

During the past year they had been very happy to welcome prominent members of the plastics industry and to show them something of their facilities and work programme. They had also had some very friendly talks in London and it was hoped this would prove to be of mutual benefit to the members of both industries as time went on. He thought members realized that a considerable effort at Shawbury was already being devoted to plastics work, and mentioned work going on in connexion with PVC and the setting up of a new small laboratory for the physical testing of plastics. In terms of staff at the moment 30% of the work of the staff of the research and technology divisions was in the plastics field. Mr Collett continued:

'I want to say, on behalf of myself and members of the council, how much we appreciate the efforts of the director and our secretary, and of the staff both scientific and administrative at Shawbury. They are doing a great job. Dr Watson has brought his own special brand of enthusiasm and leadership and this has had a very marked effect.'

After thanking members of council and the members of all the committees, Mr Collett said in conclusion that closer collaboration between the scientific staff at Shawbury and their opposite numbers in their respective firms was an excellent thing.

'I also feel,' he added, 'that I should issue a note of warning about the amount of time which our director is drawn into spending on non-scientific matters, and I would like to feel that the council has the support of this meeting in saying to the director we do hope that you will preserve as many direct contacts as you personally can. At the same time we do feel that your main purpose is for scientific effort for which you are so well qualified to lead and direct and for which you have such a particular flair. I am quite sure that if we keep that sort of thing in mind the efforts of the scientific staff at Shawbury will move steadily towards new pinnacles of success in the

*Described and illustrated in *RJIP*, June 6—Ed.*

wide area of development work which is going on in our industry both in this country and abroad.'

RABRM Luncheon

At the luncheon which followed the annual general meeting, Mr P. W. Howard said that he, with others, had long urged the need for co-operative research in the industry. Now they were making great progress in rubber research and in their excursions into the plastics field. Much of their success stemmed from the chairman of council and his various committees and thanks were due to those who served on them. Having been through the chair now occupied by Mr Collett, he knew what hard work was involved. The past year, he went on, had been one of change and consolidation during which they had raised their sights. They were embarked, he added, on a continuous voyage of discovery.

Dr Scott, scientific adviser to RABRM, acknowledges presentations made to him at the lunch following the Association AGM. On Dr Scott's right is Mr P. W. Howard, Association president, who made the presentation, and on the speaker's left Mr D. B. Collett, chairman of council

Mark of Esteem

It was now his pleasant task, Mr Howard continued, to make a presentation to Dr Scott, director of research until November last, and now scientific adviser. Dr Scott, he said, was a hard and untiring worker and a confident scientist with an eager eye for detail. Until recently he had been a member of 62 different committees. He was author or part author of more than 180 major reports and papers and many books. Now at the age of 59, he was continuing his work. His record was one of which any man had every right to be proud. It was with great pleasure on this special occasion, said Mr Howard, that he could hand to Dr Scott some token in appreciation of long and loyal service in a sphere he had filled with such distinction and as a symbol of the regard and esteem in which he was held.

The presentation, in two parts, consisted of a framed portrait of Dr Scott, which was to hang in the director's office at Shawbury, and a pair of very special lightweight binoculars suitably inscribed which it was hoped Dr Scott would find useful on his walks.

In a brief reply, Dr Scott said he was most grateful to Mr Howard, and through him to the council. He said he wanted to take the opportunity to renew his thanks to the staff at Shawbury and his best wishes to his successor, Dr Watson.

In proposing the toast of the guests, Mr Collett said that the team at Shawbury were naturally responsive to encouragement and it was therefore all the more pleasant that so many had turned up for the meeting and the luncheon. They had with them many distinguished guests, among them Dr A. T. Green, director of research, British Ceramic Research Association; Mr A. A. Heath, Permali Ltd., representing the British Plastics Federation; Dr Bateman, BRPRA; Mr Chichester-Miles, newly-elected president of the FBRAM; Mr Frankenburg, retiring president, and Mr Stuart C. Covell, director of FBRAM. He hoped that all had had a worthwhile day.

Dr Green, in his reply on behalf of the guests, said that research associations were among the finest things the country had ever brought into being. They did something for British industry that no other organizations could do. He believed that the country could not prosper without its research associations. He went on to express thanks for the association's hospitality.

Indonesian Tyre Factory

A new tyre factory has started production to help meet the country's needs. The factory is a joint Indonesian-Czechoslovak enterprise. The name is Intirub (Indonesia Tyre and Rubber Works). Its machines and equipment were supplied by the Techno-Export Ltd. of Prague. The factory is now operating to about 75% of its capacity and able to produce some 1,000 tyres per day. Later on, production will reach 500,000 tyres per year.

Automotive Rubber

SAE-ASTM TECHNICAL COMMITTEE MOVES

A COMPLETE reorganization of all cellular elastomers as they appear in SAE 10R and ASTM D-735 is in the offing. At a recent meeting of the Society of Automotive Engineers — American Society for Testing Materials technical committee on Automotive Rubber, members agreed that the three types of foam and sponge, namely rubber, vinyl, and urethane, should not be lumped together in any nomenclature system. Nor should they be tested by the same methods.

Two hundred and twenty grades of rubber needed by the Department of Defense are being incorporated into the new master rubber specification which combines both the SAE 10R and ASTM D-735 requirements.

TCAR members approved a reduction in the time requirement for the elastomer compound compression set test. It is now 22 hours as compared to the previous 70 hours. In doing so, they pointed out that the new specification format would enable any consumer to specify a 70-hour test, if so desired, by means of a suffix number. Selection or development of test methods for determining stress relaxation of elastomer compounds plus the assignment of values for incorporation in ASTM D-735 tables form the scope of a new TCAR subsection. The effects of time and temperature on stress relaxation will be investigated.

I.C.I. 'ABS Copolymers'

The Plastics Division of I.C.I., which already manufactures a range of butadiene copolymers incorporating acrylonitrile, styrene and methyl methacrylate, is proposing to extend activities into the field of products generally known as 'ABS copolymers' each containing acrylonitrile, butadiene and styrene.

Arrangements have been made with the United States Rubber Company to operate under certain of their patents, and to produce a range of 'Kralastic' compositions in the United Kingdom. Until manufacture is established, a range of extrusion grades of copolymers will be imported and distributed under the 'Kralastic' name. They will be sold through the normal I.C.I. sales channels and stocks will be held in the United Kingdom.

International Plastics Exhibition

June 17-27, Olympia, London

PREVIEW OF MACHINES, MATERIALS AND PRODUCTS

PLASTICS production and processing machinery; ancillary equipment of all kinds; raw materials and finished products from the UK and overseas are to be seen in impressive profusion at the International Plastics Exhibition and Convention, Olympia, London, June 17-27.

The British Plastics Exhibition, organized by *British Plastics*, has been held biennially since 1951 and has become progressively larger until this year, under its new name, its scope has been extended to include exhibits from 15 countries which will be shown on the stands of more than 300 companies occupying a total area of some 310,000 sq. ft.

Among the machines on view are many of considerable interest in the injection moulding, extrusion and vacuum forming fields in which new devices and techniques make possible faster cycling and more ambitious products. Raw materials include new developments of old standbys, as well as notable newer materials such as polypropylene, polyamides, including nylon 66, high impact PVC, the interesting ABS materials, and the new butadiene copolymers.

The following pages give an illustrated preview of some of the finished products, machinery and equipment as well as details of raw materials on show. An aid to indentification of companies' staff on the various stands by visitors to the exhibition, especially those from overseas, is provided by photographs of directors, technical and sales personnel who will be manning the stands. Stand numbers follow the company names.

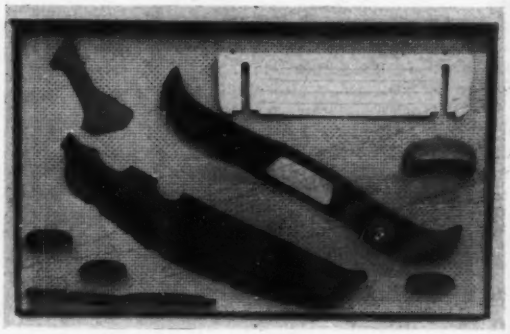
Saro Laminated Wood Products Ltd.—26

The main feature of the display of Saro Laminated Wood Products Ltd., Folly Works, Whippingham, East Cowes, Isle of Wight, which will include deep-drawn inner liners and door liners for refrigeration, radio and television parts, advertising ' point of sale ' exhibits and display and packaging for the food, pharmaceutical and cosmetics industries, will be ' Saroy ' high-impact polystyrene sheet. Varieties of polythene sheet—' Sarclene ' and ' Sarolene '—' Dowpac ' packing (made under licence of the Dow Chemical Co., US) assembled from vacuum-formed 'Saroy' sheet, and ' Sarofoam ' expanded polystyrene foam will also be shown. Other exhibits will be glass fibre-reinforced plastics, ' SaR-ReZ ' liquid plastic and ' Sarolite ' and ' Saropane ' fibre glass corrugated roofing sheets.

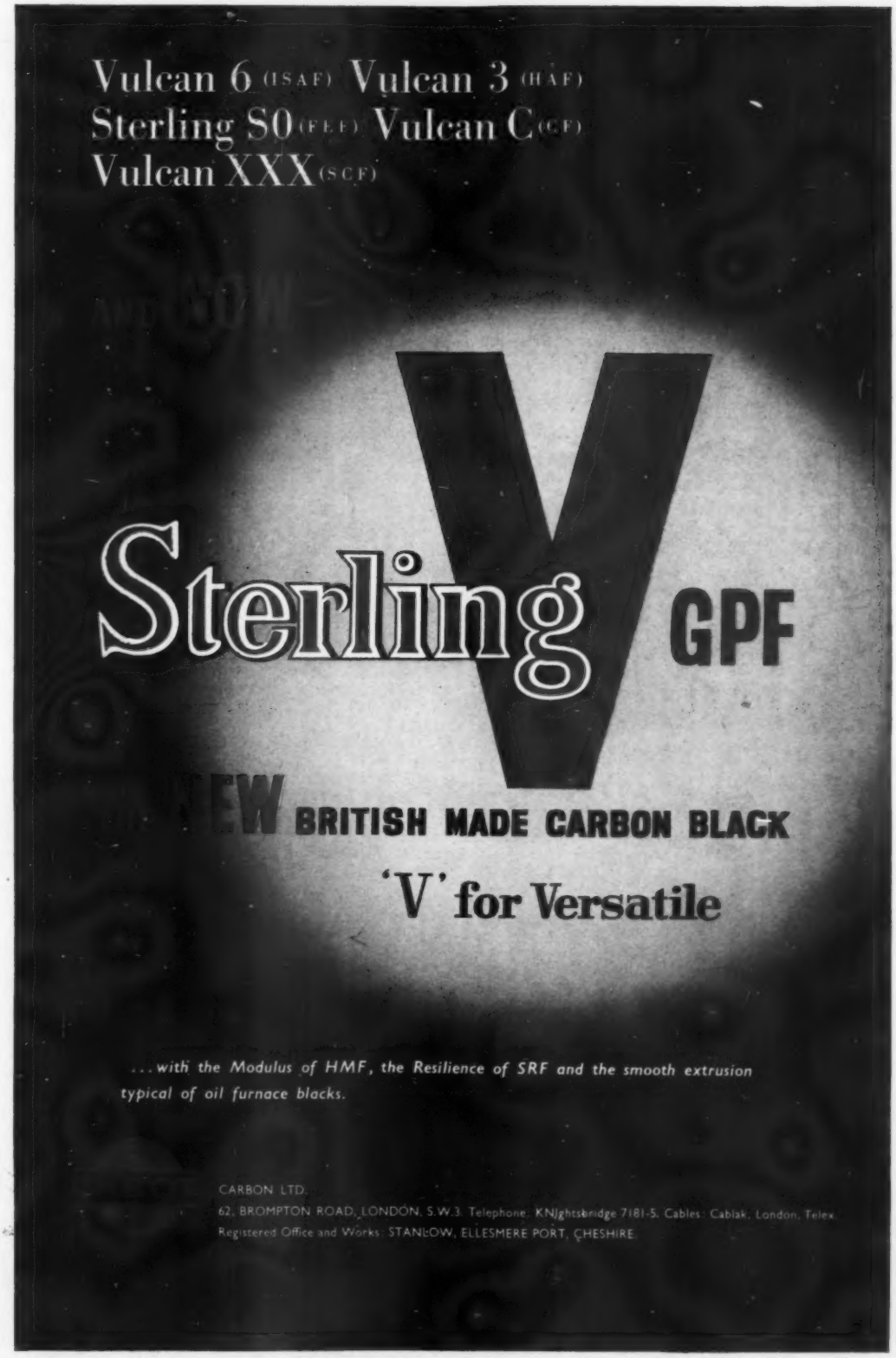
On the stand of Saro Laminated Wood Products Ltd., E. L. Williams, technical manager, J. P. Geoghegan, sales manager (home), L. S. Hunt, technical sales manager, J. A. Gouge, director and general manager, B. J. Rees, sales manager (export), S. W. Gillies, director, and J. H. L. Breaks, technical service

North British Rubber Co. Ltd.—424

US ' Royalite ' nitrile thermoplastic which, it is claimed, combines the elasticity of rubber with the rigidity of a plastic to achieve toughness, impact strength and appearance, will be on view on the stand of the North British Rubber Co. Ltd., Castle Mills, Edinburgh. US ' Royalite ' has many attributes, in particular attractive appearance in all colours with smooth or textured finish; featherweight but strong; flexible or rigid according to the needs of the designer; chemical and grease resistant. Its present uses are mainly in the automotive industry; these include fascia safety crash pads (backed with foam), seat trim panels, arm rests, roof and door linings, and a variety of interior trim. In this latter respect it is also being used in airliners. Other applications include for instrument cases, food trays, tote boxes and meat boards.



A selection of interior body trim parts of US ' Royalite ' nitrile thermoplastic. The North British Rubber Co. Ltd.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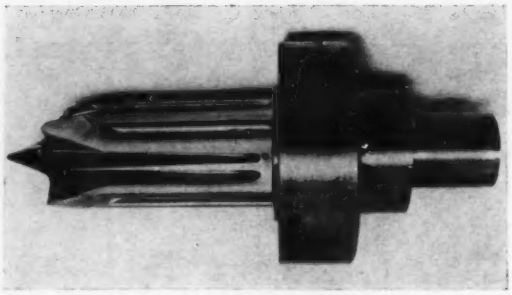
Peco Machinery Sales (Westminster) Ltd.—68

Injection moulding machines will be featured on the stand of Peco Machinery Sales (Westminster) Ltd., 28 Victoria Street, London, W.1. The Peco 30ms30 machine incorporates a new heating chamber, the 'Thermax,' which halves moulding cycle duration. Under this system heating is applied to the plastic material from the centre by four electric elements within the spreader, as well as conventionally from the wall of the chamber. The Peco IMM machine has a stroke mechanism consisting of toggles driven by a hydraulic ram, so that adjustment of the mould-opening stroke is a simple matter. This and other points will be clearly illustrated on the company's stand. A special feature of the Peco machines is an especially large platen area and distance between tie bars. This accommodates larger projected area moulds for multi-impression polystyrene work and for larger mouldings, especially in polythene. The company puts emphasis on greater output and quality and service to overseas buyers.



'Thermax' spreader for air injection moulding machine. Peco Machinery Sales (Westminster) Ltd.

On the stand of Peco Machinery Sales (Westminster) Ltd., Mr H. Munns, Mr E. Gaspar, Mr L. W. Lees, Mr G. T. Byas, Mr J. Bruce, Mr C. T. Scales and Mr Baldry

Spa Brushes Ltd.—300

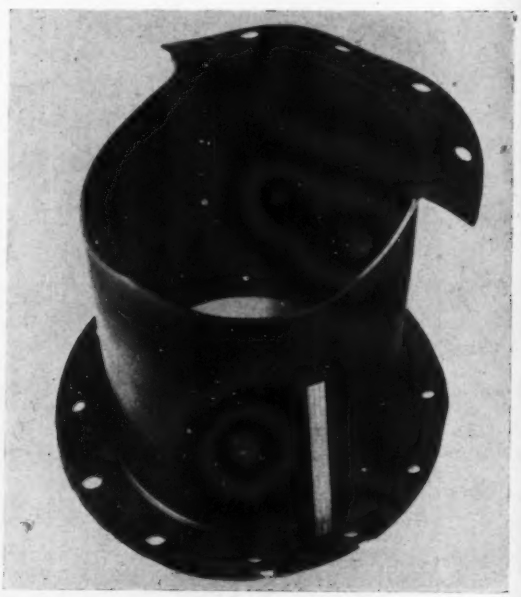
The plastics division of Spa Brushes Ltd., Chesham, Bucks., will be showing a selection of mouldings. The company exports to nearly 70 countries.

Durable Plastics Ltd.—99

Durable Plastics Ltd., Woodbridge Industrial Estate, By-Pass, Guildford, Surrey, will have on display a wide range of articles that have been coated in PTFE, nylon, PVC, polythene, PTFCE and neoprene for the chemical, domestic and automobile markets.

Siemens Edison Swan Ltd.—66

A large xanthating churn lined with PTFE dispersion will form a dominant feature of the exhibit of Siemens Edison Swan Ltd., 155 Charing Cross Road, London, W.C.2. Other interesting items will be PTFE-covered rollers for the baking industry and a section of a 20ft. long roller used in paper making, coated drying rollers as used for prevention of size adhesion in textile mills, together with a selection of sheet, rod, tape bar and other standard sections. Examples of the new Siemens Edison Swan PTFE instrument wire applicable for the aircraft, electronic and chemical industries are to highlight a selection from an extensive range of PTFE radio and electronic components. Domestic equipment mouldings will form part of a wide variety of mouldings seen on the stand, extending to electrical switchgear and control gear mouldings; instrument, electronic, radio and associated mouldings; and mouldings for the motor car and radio industries. In the chemical applications section PTFE tubing, both thin-walled and the more robust type, and also a range of capillary tubing will be seen. A range of PTFE beakers from 50ml. to 10l. will also be on show, together with evaporating dishes and PTFE watch glass covers. Also gaskets, packings and a series of PTFE tapered sleeves for ground glass jointing as supplied to the Loughborough Glass Co. Ltd. The central feature of the Aldridge Plastics exhibit will be a range of telephone mouldings, including those being produced for the new British Post Office telephone. This company manufactured the fireproof acoustic curtains which lined the walls and ceiling of the American theatre at the Brussels Exhibition, and a small section of this will be displayed.



Flexible PVC coupler, 18in. by 24in. Durable Plastics Ltd.

Rubber Improvement Ltd.—414

The Rubber Improvement Group, Rilex Works, Wellingborough, Northants, will be featuring a wide range of materials and products. Of special interest will be: 'Rilonide'—a new plastic for the manufacture of handbags, travel goods, etc., and for the furnishing and allied trades; 'Rilquilt'—a new material which combines the effect of quilted leather or fabric with the non-

staining, dirt-free, mothproof and hard-wearing properties of PVC; 'Rilprint'—super flexible printed and embossed PVC sheetings in various colours, designs and embossings, used in increasing quantities for curtainings, rainwear, toys, games and inflatables; 'Riltex'—a new lightweight material, which is a combination of PVC and 'Terylene,' and which has been specially designed for waterproof covers, tarpaulins and sheets, and many industrial and consumer applications; 'Britannia'—a vinyl flooring in a range of marbled colours. Grades for both industrial and domestic uses are produced in either 36in. wide rolls or 9in. x 9in., 12in. x 12in. and 18in. x 18in. tiles. Also on show will be: 'Rilene' plain, embossed and multi-ply PVC sheetings; 'Rilite' translucent and opaque glass fibre sheets; 'Vanlite' glass fibre vehicle roof and body panels; 'Rilplate' toughened polystyrene and rigid polythene sheets; 'Leonex' and 'Rilflex' PVC multi-ply 'Green-for-Safety' fire-resistant, anti-static conveyor beltings incorporating both natural and synthetic fibres; and a range of mouldings and extrusions.

'Vanlites' fitted to the vehicle on the left improve lighting in all corners of the interior. Rubber Improvement Ltd.

Bakelite Ltd.—35

The exhibit of Bakelite Ltd., 12-18 Grosvenor Gardens, London, S.W.1, will evidence the increasing use being made by the plastics industries of Bakelite materials. Some of the most recent developments in plastics will be used in the construction of the stand. Prominently featured will be a display of the uses of polythene for packaging, building, agriculture and horticulture and also on view will be self-coloured PVC 'Vybak' colourmix compounds, which enable users of PVC compounds to produce a wide range of shades simply and quickly by varying the proportion of each of the basic colours in the mix. Epoxides and phenolic resins will be featured, a printed circuit will be shown to illustrate the advantages of printed circuitry using Bakelite copper-clad laminate. Also incorporated in the company's exhibit will be reinforced Bakelite polyster resins; a comprehensive display of the use of 'Shalon' monofilament polystyrene brush materials, consisting of the decorative grade (BA200) in a variety of diameters, colours and crimps, and the hard-wearing industrial grade (DBA 214); and 'Warerite' veneers and wallboard in a wide range of patterns.

Engis Ltd.—46

Engis Ltd., Gabriel's Hill, Maidstone, Kent, are presenting, for the first time, 'Arburg' air-operated injection moulding machines—one automatic and one semi-automatic. Also on show will be: 'Hyprez' diamond lapping compounds as used in many plastic companies for the super-finishing of moulds, press tools, plastic extrusion dies, hobs and hobbed dies; the brush sander-head, a rotary abrasive tool used for deflashing plastics, blending contours, removal of machine marks on plastics and general abrading of contoured surfaces without deforming the original shape; 'Abradisc,' a self-adhesive grinding disc sold in a multiplicity of sizes and grits, for the blending of machine marks, grinding and prefinishing of general contours in moulds, etc.

C. and C. Marshall Ltd.—305

C. and C. Marshall Ltd., 1264 High Road, Whetstone, London, N.20, extruders and fabricators of plastic sections, will present a selection of standard and special lines which covers a wide range of industrial applications. Among the most important applications are tennis tapes, hoops and team braids for the sports equipment trade, wing pipings, joint mouldings and upholstery piping for the motor trade and interior and exterior trims for coach and caravan builders. Also on display will be layflat tubing for packaging, welting, randing and decorative lacing for the shoe trade and escutcheon beads and sleeving for the radio and electrical industries. There will be a wide variety of sealing strips and gaskets for numerous industrial applications and a highly popular range of plastic trims for the pram and nursery furnishing field.

Three rigid extrusions by C. and C. Marshall Ltd.

F. J. Edwards Ltd.—48

The following machines will be shown by F. J. Edwards Ltd., 359-361 Euston Road, London, N.W.1. The new 'Parnavac' fully-automatic vacuum-forming machine, Model 2620, of all-steel construction, suitable for the rapid forming of delicate cellulose acetate foil up to heavy gauge PVC and polystyrene sheets. With a maximum forming area of 26in. x 20in. and a drawing depth of 0in. to 13¾in., this machine has a working height of 38in. The 'Maxinec,' type HPA, an automatic high-frequency machine for welding thermoplastic materials, with fully-automatic material transport. Specially suited for welding from roll material. The 'Maxinec,' type HF1200, a foot-operated machine suitable for welding a wide range of plastic articles. Available in four sizes with net output capacities of 300, 800, 1,200 or 2,000W. The 'Presto' 700 sealer, a heat impulse appliance for welding all standard types of plastic foils. With foot-pedal operation, for seam lengths up to 15½in., 27½in. and 43in. approximately. The 'Seymour' injection

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(Douglas 5433)

41 WATER STREET
BIRMINGHAM, 3
(Central 6471)

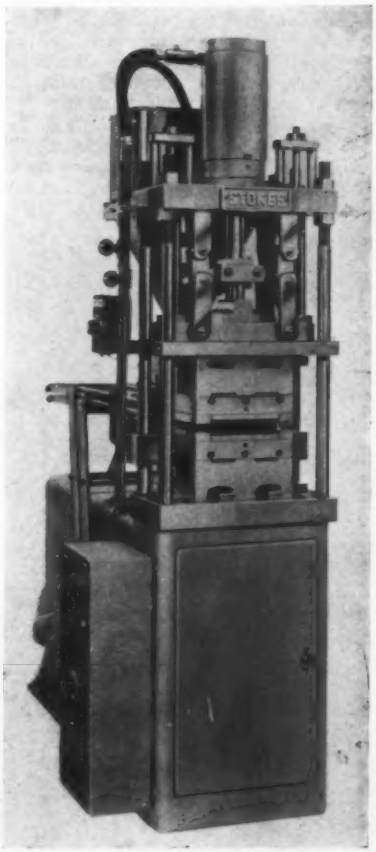
moulder, a bench-type machine for all thermoplastics. Designed for fast production runs—up to 400 shots per hour are possible. The 'Besco' horizontal band-sawing machine, type HB24, for cutting out components vacuum formed in plastic sheets. The 'Besco' pneumatic all-steel guillotine, designed to connect to existing air-line supply; requires a working pressure of 80psi. Can be used for repeat or non-repeat action. The 'Besco' open-end treadle guillotines, with adjustable front, back and side gauges, and finger guard. Capacity 24in. x 16SWG, etc. The 'Sandt' clicking press, model ST139, an electro-hydraulic press for cutting small parts. The 'Kuris' band-knife machine, model BKR, for cutting the smaller synthetic plastic foam blocks, with a metal rolling table 59in. x 47½in. The 'Seymour' granulator, model SRS, bench type, fitted with adjustable static blades. The 'Fuchs Muhlin' granulator, model 180S, bench type, fitted with knives of sloping cut, making it ideal for tough and soft products. With the exception of the guillotines, clicking press and injection moulder, all machines are being exhibited for the first time.

On the stand of Baker Perkins Ltd.—*left to right*, **Mr B. S. C. Quint, Mr R. W. Doone, Mr J. C. H. Scott, Mr G. I. Powers, Mr J. A. F. Halford** (*back*) **and Mr A. V. Francia**

shown and will include the now established 1½in., 2in. and 3½in. sizes, which will be working in conjunction with the layflat and tube haul-off machines. All types of die-heads can be fitted for use in the production of extruded sections in either plastics or rubber. A new range of vacuum-forming machines is now available and the type 'R' continuous machine and the new 'Crystal Pack' will be demonstrating the capabilities of the units, which are fully suited for conventional vacuum-forming techniques. Baker Perkins mixers will also be shown and

injection—is only 5sec., exclusive of curing. The main cylinder of the press is air-operated, with its action applied and multiplied through a toggle to give fast initial closing and relatively slow final closing, matching the flow of material in the mould. The press is sequence-operated, with each step of the cycle depending upon the successful completion of the preceding step. Protective devices stop the press in case of the slightest interruption to operation. The press can mould any number of cavities within the available platen area of 10in. by 6in., subject only to the 25ton maximum pressing capacity. A shuttle-type feed supplies multiple rows

'Parnavac' model 2620 vacuum former. F. J. Edwards Ltd.



The new 25-ton version of the Stokes Model 800 air-operated high-speed, fully automatic plastics moulding press. Alchem Processes Ltd.

Baker Perkins Ltd.—41

Baker Perkins Ltd., Westwood Works, Peterborough, will be showing several machines for the first time publicly. The latest additions to the company's range are the 'Plastmatic' injection moulding machines, which are now being produced at Peterborough under licence from the well-known firm of A. Triulzi, of Milan. These machines are self-contained, fast cycling, incorporate the most modern designs and are available in capacities from 1 to 350oz. They will be represented on the stand by the 'Plastmatic' 30, 140 and 350 (1, 5 and 11oz.). The latter is fitted with a pre-plasticizer unit. Baker Perkins extruders will also be will be represented by the size 11 'Simplex' and the size 8 'Universal' machines. Other items will include Dreher cutting mills and a full range of ancillaries, including floor tile units.

Alchem Processes Ltd.—85A

A 25ton version of the new Model 800 air-operated high-speed fully-automatic plastics moulding press manufactured by the F. J. Stokes Corporation, of Philadelphia, will be featured on the stand of Alchem Processes Ltd., 36 and 38 Peckham Road, London, S.E.5. The Model 800 press is designed to mould all thermosetting plastics at unusually high speed. Its complete cycle time—including feeding, closing, opening and

of cavities from front to back. The powder is fed directly to the cavities at ½in. range, so there is no wastage of powder and the mould surface is kept clean and free of loose powder. Ejection is automatic, mechanical and positive for either top or bottom ejection. A cam actuates the knock-out pins, either top or bottom; a sliding comb mechanically takes the pieces from the pins and delivers them to the receiving bin. Air is used during ejection only to clean the cavities.

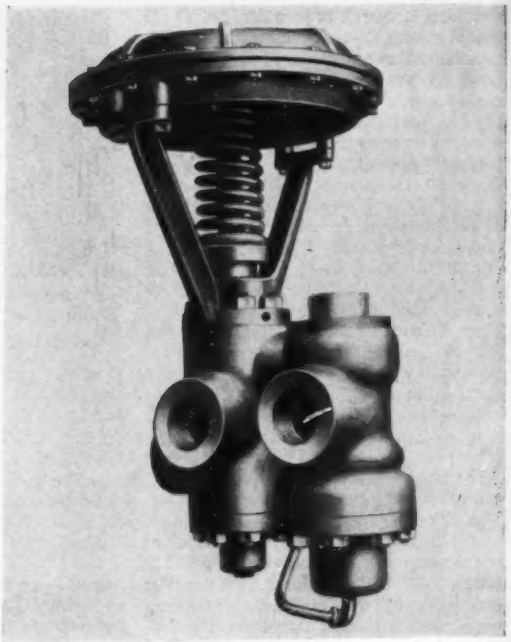
Scott Bader and Co. Ltd.—232

Illustrations of the wide variety of applications of their 'Crystic' and 'Marco' polyester resins for reinforced plastics will be featured on the stand of Scott Bader and Co. Ltd., Wollaston, Wellingborough, Northamptonshire. These applications include boats (dinghies, lifeboats, cabin cruisers and luxury launches up to 60ft. in length), car and commercial vehicle cabs, transparent and translucent roof sheeting and architectural panels, display models, chemical plant, furniture, railway canopies, radomes and ducting for aircraft and castings of all sizes down to buttons.

Radio Heaters Ltd.—37

Radio Heaters Ltd., Eastheath Avenue, Wokingham, Berks, will feature electronic preheating equipment for the rapid - cycle thermosetting moulding technique. This method makes it possible to double or in some cases to treble the number of lifts per hour by merely replacing older low-power preheaters with high-power modern units and at the same time making various adjustments to mould temperatures, etc. On display will be the popular 1kW, 2½kW and 5kW 'Radyne' preheaters, all of which have been completely redesigned within the last four months. In addition, there will be a completely new 10-12kW 80mc. preheater, which is extremely compact and very competitively priced. The manufacturers consider that this new preheater will ultimately become standard for thermosetting mouldings of ¾lb. and over.

'Radyne' 5kW preheater. Radio Heaters Ltd.



Four-way pneumatically-operated valve for the control of double-acting hydraulic rams. Hunt and Mitton Ltd.

Hunt and Mitton Ltd.—422

Hunt and Mitton Ltd., Oozells Street North, Birmingham, 1, will be showing a new range of pneumatically-operated four-way valves for the control of double-acting hydraulic rams, eliminating the need for two three-way valves of the conventional type. These valves, which are suitable for operation either through a manual pilot or an electric timer, are operated by a single diaphragm top. This simplification is achieved by using the line pressure to operate one section of the valve on a differential area principle. A two-way valve may also be installed in one of the cylinder lines to allow the ram to be stopped in any position desired. The valves are suitable for hydraulic working pressures from 200psi up to 3,000psi (non-shock) at temperatures up to 140 F., and are made in sizes ¾in., 1in., 1¼in. and 2in. A 300lb. rating four-way valve is also available in sizes ¾in. and 1¼in. only.

Foster Yates and Thom Ltd.—65

Three new machines which will be demonstrated in operation on the stand of Foster Yates and Thom Ltd., Blackburn. The Foster Wucher injection-moulding machine No. 175H-W200A is a two-unit, single-mould injection-moulding machine comprising a high-pressure hydraulically-operated pre-plasticizing injection unit and a 175ton hydraulically-operated high-speed horizontal clamping unit. The Foster Wucher injection-moulding machine No. 100-RT-W200A is a three-unit, multi-mould injection-moulding machine comprising a high - pressure hydraulically-operated pre-plasticizing injection unit, a 100ton vertical clamping unit and a 10-station rotary table unit fitted with 10 mould carriers. The third machine, a Foster Wucher W700 automatic low-pressure screw-type in-

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jection-moulding machine, is an automatic version of the original manually-operated Foster Wucher W700 machine exhibited at the 1957 British Plastics Exhibition.

On the stand of Foster Yates and Thom Ltd. will be, *left to right*, Mr J. Podevyn, chief designer press division, Mr A. E. Balfour and Mr R. Crossman, technical representatives

Monsanto Chemicals Ltd.—76

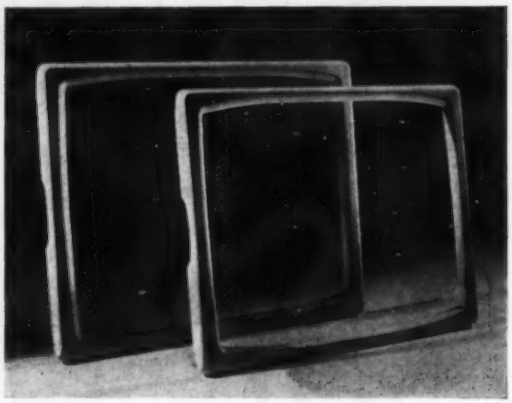
Flooring, walling, ceilings, insulation and balustrading in plastics will be featured on the stand of Monsanto Chemicals Ltd., 10-18 Victoria Street, London, S.W.1. Special features will include 'Ppelicon' tiles for flooring, consisting of pellets of 'Lustrex' (Monsanto's polystyrene) embedded in concrete; walling faced with 'Permulux' panels, which are also made from 'Lustrex'; translucent panels made from 'Polyflex' — polystyrene sheet manufactured by the Plax Corporation of the US and marketed in Britain by Monsanto. Apart from all these applications in building, other uses of plastics will be featured, such as 'Lustrex' polystyrene in the refrigeration and shoe heel industries. A special section of the stand will illustrate the use of Monsanto's various plastics products by the packaging industry. Part of the ground floor of the stand will include a display by Monsanto Boussois, of France.

Simmonds Aerocessories Ltd.—420

Simmonds Aerocessories Ltd., Treforest, Glamorgan, a member of the Firth Cleveland group, will exhibit a selection of products of interest to the plastics industry. For use with live electrical equipment a knob-fixing clip and a combination spring-steel and nylon nut have been developed, both of which conform to BS415. Of particular interest will be a spring-steel nut which clips on to a shallow moulded 'tee,' thus dispensing with moulded inserts. A wide range of fixes is available for use with plain moulded studs for attaching mouldings in all types of plastic. 'U' nuts and flat nuts are finding increasing applications in the construction of glass fibre car bodies, as they may be moulded in during manufacture or simply clipped into position on the assembly line.

Ekco Plastics Ltd.—226

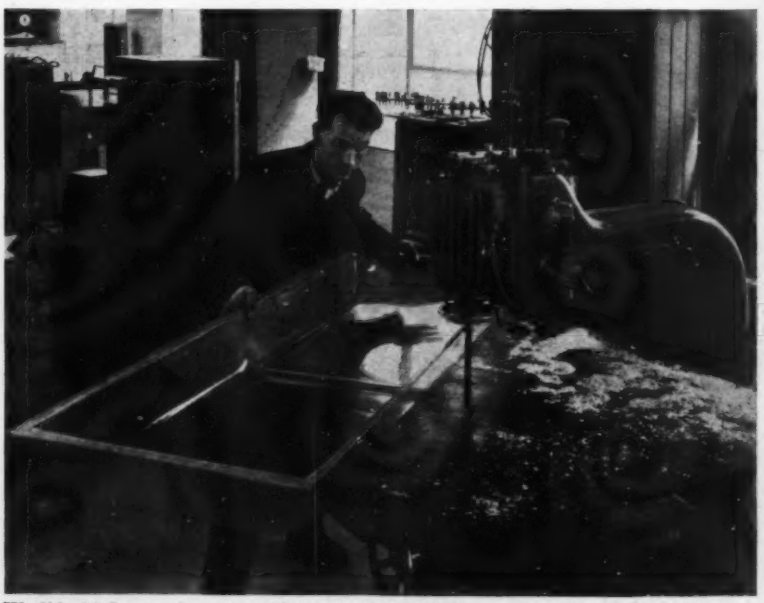
An extensive range of mouldings for many industries will be featured on the stand of Ekco Plastics Ltd., Southend-on-Sea, Essex. Of special interest will be the largest injection moulding so far produced in the UK—a lining for a recently announced Frigidaire 3.3cu. ft. refrigerator. This moulding is being produced on the much publicized injection machine, the Windsor AP335. The Ekco exhibit will incorporate a wide selection of injection-moulded, compression-moulded and vacuum-formed components. The motor industry will be represented by the compression-moulded steering column shroud and instrument housing for the Rover 3litre model, while a number of precision mouldings for the Kodak camera range will illustrate the growing use of plastics in the photographic trade. Other exhibits will show the use of Ekco mouldings in radio and television, electronics, domestic appliances, advertising display, telephones, typewriters, building, textile production, etc., and a large selection of Ekco 'Gold Seal' domestic ware will also be displayed. The new Ekco 'Slimline' toilet seat, winner of the first annual I.C.I. 'Alkathene' design competition, will be a feature of the Ekco proprietary lines on show.



Moulded in high-impact polystyrene, these refrigerator tray-top surrounds for Electrolux Ltd. are produced on single impression tools. Ekco Plastics Ltd.

Wadkin Ltd.—56A

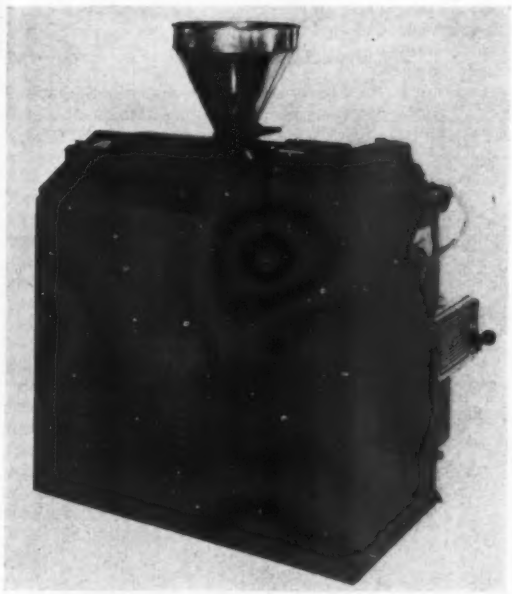
Prominent among the seven machines to be exhibited by Wadkin Ltd., Green Lane Works, Leicester, will be the latest high-speed router, LS. Working with simple templates and former pin, fast production rates are maintained on a variety of operations. It will do flashing, face milling, pocketing, internal and external profiling, etc. Another interesting machine will be the inexpensive 10in. tilting arbor sawbench, AGS. This machine has all the features for fast, accurate sawing of every class of plastic material.



Wadkin high-speed router, LS, removing flash from a trough at Invicta Plastics Ltd., Oadby. Wadkin Ltd.

Castleton Plastics Machinery Ltd.—91

Two extrusion machines which will be on show on the stand of Castleton Plastics Machinery Ltd., Mill Works, Castleton, near Sheffield, will be of the 1½in. dia. screw size. They incorporate a number of interesting features, including variable-speed controls, water cooling to extruder barrel and screw, quick attainment of working temperatures and capacity to extrude sections which are normally associated with much larger machines. Another piece of equipment which will be shown is a universal track haul-off which is capable of accepting and taking off the most awkwardly shaped rigid sections and large-bore tubes in either rigid or flexible materials. The other haul-off on show will be of the traditional belt-type incorporating a novel form of drive and extreme simplicity in all adjustments. The aim of all the exhibits on this stand is to eliminate difficulties and time wastage which has been observed in the extrusion industry.



Extrusion machine with a screw size of 1½in. Castleton Plastics Machinery Ltd.

Brookes (Oldbury) Ltd.—418

A range of extruding machine cylinder liners made of 'Xaloy,' a very hard wear-resistant metal which has been pioneered in the US and is now available in the UK, will be shown by Brookes (Oldbury) Ltd., Oldbury, Birmingham. The advantages of 'Xaloy' are, it is claimed, that it permits more efficient speeds, temperatures and operating conditions, continuous operation, reduced replacement costs and reduced down time. Two variations of the metal are 'Xaloy' and 'Xaloy-306.' The former is a high-cast boron iron with certain alloy additions to increase hardness and wear resistance, and the latter is a corrosion-resistant alloy consisting principally of cobalt and nickel.

Metal Box Co. Ltd.—219

The Plastics Group of the Metal Box Co. Ltd., 37 Baker Street, London, W.1, will be showing a wide range of plastics packaging, including: 'Diothene' multi-colour printed polythene film bags for packaging fresh produce, etc.; 'Metathene' polythene-coated cellulose film for vacuum packaging bacon and cheese and for unit packs of liquids and tablets; 'Poly-Tainer' plastic bottles for cosmetics and toilet preparations, pharmaceuticals and household products, chemicals and foodstuffs; 'Polytube' polystyrene tubes for pharmaceutical tablets and other small items; 'Polypot' polystyrene pots for foods and toilet preparations, available transparent or in semi-transparent or opaque colours; 'Polycup' high-impact polystyrene disposable drinking cups for indoor and outdoor catering; and laminations of plastics films, paper and/or foil for unit packs and for sampling. Suitable for foods, pharmaceuticals, toiletries, tobacco and many other products.

A selection of items—'Diothene' bags, flexible 'Poly-Tainers,' 'Polycups' and laminated sachets—manufactured by the Plastics Group of the Metal Box Co. Ltd.

Bellow Machine Co. Ltd.—506

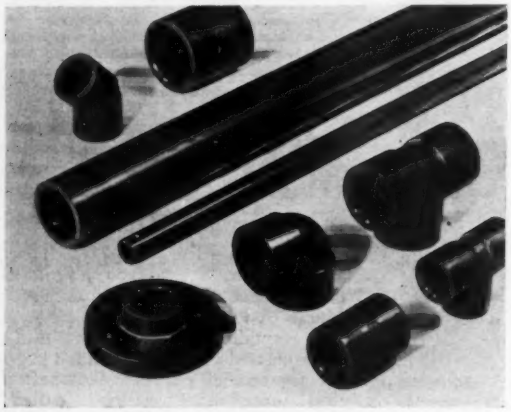
A display of welding and cutting machinery will be seen on the stand of the Bellow Machine Co. Ltd., Bellow House, Grafton Street, Leeds, 7. The PFAFF 8197 plastic welder, of German manufacture, is designed for bonding thin and extra thin PVC, polyamide and polythene films and another welder on show, designed for seams, will be the PFAFF 8300. Bellow products include two automatic sharpening cutters.

M and B Plastics Ltd.—209

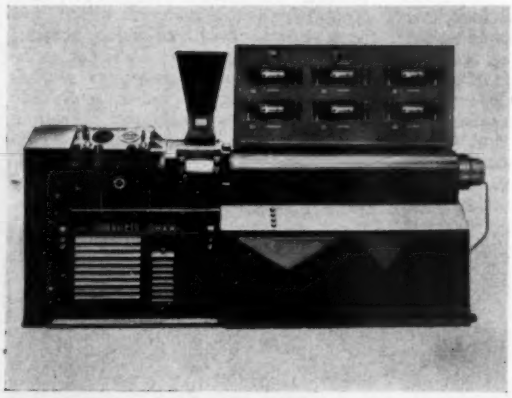
M and B Plastics Ltd., 45-47 Wigmore Street, London, W.1, will be exhibiting their complete range of thermoplastic products. These will include: Cellulose acetate moulding powder, sheet, film, tubes, rods and profiles; extruded products for special purposes, including optical materials; 'Acelon' coated fabrics, which are a range of products comprising textile materials which have been coated with cellulose acetate; various ethyl cellulose films for technical applications; polyvinyl alcohol films, including a cold-water-soluble grade used for water-soluble packaging and other technical applications. Two metallized films will be displayed: 'Mirralon' cellulose acetate film metallized with aluminium, available

lacquered in a range of colours; and 'Meculon' polyester film metallized with aluminium. Other special products will include various grades of tracing films for drafting purposes and commercial art work for use with ink, pencil, etc.; a special film for the production of direct positives from letterpress type useful in lithographic plate preparation; and 'Uvethon,' an amber-coloured sunblind film giving maximum protection against fading. The most recent additions to the company's range, 'Rhovilene' and 'Technyl' type C, will also be on display.

BTR group products wholly or partly of plastics fabrication exhibited will include: 'Plastidry' PVC/nylon or PVC/'Terylene' hose for fire-fighting, irrigation and industrial purposes; 'Pluvicor' and 'Silvertown' fire-resistant PVC conveyor belting for use underground; 'Pluvicor' PVC conveyor belting for food processing and handling plant. An interesting item will be a sample of specially constructed conveyor belting, embodying a unique 14-ply carcase of 100% 'Terylene,' designed for particularly arduous service.



'Silverflow PVC pipes and fittings. BTR Industries Ltd.



The 4½in. plastics extruder. Francis Shaw and Co. Ltd.

BTR Industries Ltd.—304

Emphasis will be placed upon several of their more recent developments in plastics manufactured by the BTR group of companies, Herga House, Vincent Square, London, S.W.1. These will include: 'Silverflow' rigid PVC pipes and fittings which have inherent qualities of corrosion resistance, ease of installation, low weight, resilience and resistance to shock loading, giving them wide industrial application. 'Plasticell' foamed rigid PVC materials with good thermal and acoustic insulation properties, extreme buoyancy and suitability for 'sandwich' treatment in decorative timbers, metals and other covering materials. 'Fluoroflex' PTFE for high-pressure pipelines in jet engines and circuits conducting highly corrosive fluids in the chemical and allied fields. 'Rainjoys' slip-on ladies' plastic overshoes with alternative colours and heel heights in all standard sizes. Other

Albright and Wilson (Mfg.) Ltd.—316

'Hetron' resins will be included amongst the products to be exhibited by Albright and Wilson (Mfg.) Ltd., 1 Knightsbridge Green, London, S.W.1. Included in the range of existing products manufactured by the company are plasticizers, stabilizers, accelerators, resin intermediates, corrosion inhibitors, mould release agents, fungicides and anti-foaming agents. Plasticizers available include TXP, a low-cost primary plasticizer for PVC, and NTP, which is similar in properties to TXP, but is for use where freedom from toxicity is essential. There is also a wide range of efficient heat stabilizers, including organo - tin compounds, cadmium-barium types, zinc stabilizers, epoxy resins and organo-phosphites. Also featured on this stand will be the 'Hetron' range of polyester resins, which are widely used in the US for electrical and aircraft applications, and for translucent panels in building operations. These 'Hetron' polyester resins, with similar properties to ordinary polyester resins, are also fire-retardant and self-extinguishing. The company is the sole licensee for the sale of these resins in Europe.

Francis Shaw and Co. Ltd.—427

Designed to produce high-impact polystyrene sheet up to 55in. wide x ¼in. thick the P4½in. plastics extruder which will be featured prominently on the stand of Francis Shaw and Co. Ltd., Corbett Street, Ashton New Road, Manchester, includes a sheeting die head, a screw with length/diameter ratio of 20 to 1, barrel fitted with automatically controlled heating elements and fan cooling, and a variable speed motor giving an infinitely variable screw speed of 60/15 rpm. Capacity is approximately 400lb. per hour on thick sheet. With machine will be a polishing unit having two nips. The drive for the unit is electronically linked with the pull-off unit to give adjustable tension. Robustly made shear disc-type edge-cutting knives are fitted to give a good finished edge on the thickest sheet, also an automatically operated guillotine is fitted for cutting to length. Another plastics extruder, the P1½in., has a screw speed infinitely variable from 75/25rpm. The machine is fitted with a wire covering cross-head. The Shaw K4 'Intermix' can be used for compounding not only plastics but also a diverse range of materials including paint, asphalt asbestos and ebonite. The machine is complete with a Shaw 'Sturdigear' unit drive and, when fitted with a two-speed motor, gives motor speeds of 44/22rpm; alternatively, bull gear drive can be provided. The inverted 16in. x 8in. dia. 1-4 roll laboratory calender is designed as a compact unit for production of rubber sheet or plastic film. The electrical drive features stepless speed adjustment from approximately 8ft. per minute up to 45ft. The rolls are mounted in plain bearings sealed to prevent oil contamination of the product and are steam heated or water cooled, all gearing is of steel with double helical type teeth, full flood lubrication is provided, also roll bending equipment. Other products on show will include the following: The Shaw laboratory 'Rotocure' is a small model of the well-known Shaw 'Rotocure' and provides perfect gelling and plying up of all plastic surfaces. It can also be used for continuous vulcanizing of rubber and plastic belting and for plastic sheeting and tubing; the Shaw 'Wink' high-speed cutting machine is a new product and includes continuous and intermittent cutting of stock up to 3in. in dia and from $\frac{1}{16}$in. to 60ft. in length with infinite changes within the range in both length of cut and knife speeds while operating; the hand/hydraulic-operated injection moulding machine designed for moulding thermoplastic materials, and the 13in. x 6in. Mark II laboratory mixer.

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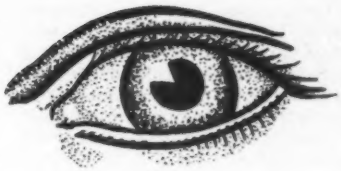

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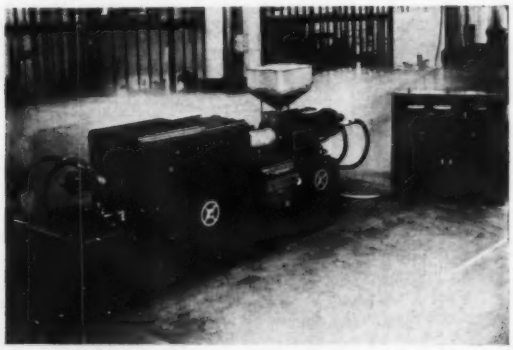
T. H. and J. Daniels Ltd. and Alfred Herbert Ltd.—38

Exhibiting jointly, T. H. and J. Daniels Ltd., Stroud, Glos, and Alfred Herbert Ltd., Red Lane Works, Coventry, will be showing a variety of machinery and equipment. The former company will be showing the following units: the 250ton low-pressure press, the largest of a range of five manufactured for reinforced plastic material; the 100ton panel-type transfer moulding press, a semi-automatic machine for use on thermosetting plastic materials; the 100ton upstroke press, supplied double or single acting; and two models of the Daniels/Latymer vacuum-forming machine. Alfred Herbert Ltd. will be showing as follows: The Edgwick 45ton injection-moulding machine developed from the well-known type 'HY' and still offered as a semi- or fully-automatic model; the Herbert/Reed Prentice 175ton injection-moulding machine—previously introduced at the 1957 exhibition—hydraulically operated and with a choice of manual, semi-automatic or fully-automatic operation; the Herbert/Reed Prentice 275ton injection-moulding machine, which replaces the well-known and highly successful 10D machine; and the Edgwick mould heating and cooling unit primarily designed for use when moulding nylon, ' Diakon ' and similar materials. The unit is self-contained and will maintain the mould temperature at any predetermined setting.

Daniels 250ton low-pressure press. T. H. and J. Daniels Ltd.



Herbert/Reed Prentice 175ton injection-moulding machine. Alfred Herbert Ltd.

British Celanese Ltd.—32

The extended range of plastics manufactured by the plastics division of British Celanese Ltd., Hanover House, 22-23 Hanover Square, London, W.1, now includes high-impact styrene sheeting, high-density polythene sheet and section, high-impact and rigid PVC sheet and section and polypropylene sheet and section. The company are also sole UK distributors for Amcel Co. Inc., New York, of ' Forticel ' cellulose propionate moulding powder, and examples of the growing range of products made from ' Forticel ' will be shown. In addition, samples of ' Courlene ' and ' Courlene X3 ' polythene monofil textile yarns and their applications are on display. Special exhibits will include the new ' Philette ' transistor radio by Philips Electrical Ltd. with a ' Forticel ' cabinet in red/grey or grey/blue; Chinese lanterns for this year's Blackpool illuminations made from ' Forticel '; magnetic recording tape made from ' Clarifoil ' cellulose acetate film coated with iron oxide lacquer; safety goggles for industry made from ' Celastoid ' optically polished sheet; ' Rotaflex ' lampshades made from ' Dexel ' acetate moulding powder; acetate typewriter ribbon; fishing nets made from polythene monofil yarn. In addition, the full range of ' Celanese ' acetate plastics will be shown with many interesting and unusual end-uses. The range covers ' Clarifoil ' cast film; ' Cellastine ' extruded sheet, rods and tubes, including the deep-drawing quality of sheet used primarily for vacuum forming; ' Celastoid ' sliced sheet, ' Cinemoid ' sliced sheet and ' Dexel ' moulding powder.

Rodmill Chemical Co. Ltd.—11

' Porofoam,' which was one of the earliest plastic foams to be marketed in this country, will be presented on the stand of the Rodmill Chemical Co. Ltd., 44 Hanover Street, Liverpool, 1. The stand will feature a complete block (or load) of ' Porofoam,' which is subsequently processed to the requirements of varied industries, including furniture, bedding, motor, aircraft, railways, boats, caravans, packaging, insulating, display, hospitals, engineering, clothing and household goods. ' Porofoam ' is available in a wide range of qualities and colours either in standard size sheets of any thickness or in prefabricated units.

BX Plastics Ltd.—71

A comprehensive display of the many thermoplastics manufactured by BX Plastics Ltd. will be on show on the company's stand. Designed as an ' exhibition within an exhibition,' the use of BX materials in 10 groups of industrial and consumer applications will be illustrated, together with specimens of the basic materials from which the end-products are fabricated. The sections have been planned to cover chemical engineering, toys and games, fashions and fabrics, refrigeration, electrical and electronics, household and office equipment, packaging, optical products, motor transport, display and publicity. There will be an example of the use of rigid vinyl in chemical plant manufacture, and another exhibit which features new development in sheet extrusion, also film and other development projects. Several new features will be incorporated in the stand construction designed to stimulate ideas for the use of BX materials for display, lighting and in decorative and constructional work.

General Engineering Co. (Radcliffe) Ltd.—20

The exhibit of the General Engineering Co. (Radcliffe) Ltd., Station Works, Bury Road, Radcliffe, Yorks, will incorporate the following machines: A fully automatic high-speed dual-reel take-up machine with coiling heads and automatic coil-tying attachment; a 2½-in. extruder; re-wind machine; capstan unit; measuring and printing machines; high vacuum pump; mechanical booster unit; and extrusion line control console.

James Ferguson and Sons Ltd.—202

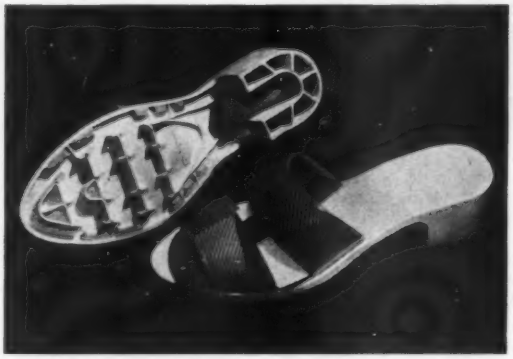
Thermosetting moulding materials, based on phenol formaldehyde and urea formaldehyde, will be featured on the stand of James Ferguson and Sons Ltd., Lea Park Works, Prince George's Road, Merton Abbey, London, S.W.19.

Beanwy Electric Ltd.—59

Induction-heating equipment for compression, injection and extrusion moulding will be featured on the stand of Beanwy Electric Ltd., Rushey Lane, Tyseley, Birmingham, 11. The equipment ensures that heat is generated evenly throughout a considerable depth of metal so that positional temperature differences are reduced. Temperature changes are instantaneous, even at a distance from the energizing coil, and heat is generated evenly at surfaces far away from the coil. There is no danger of overheating and the system is conducive to highly concentrated loadings and fast working without loss of quality or reliability. Also on show will be the 'Cycler' pellet preheaters manufactured by the company.

Barclay-Stewart (Plastics) Ltd.—102

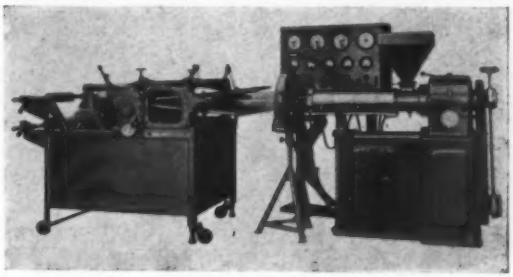
The exhibit of Barclay-Stewart (Plastics) Ltd., 25-27 Brunswick Street, Luton, Beds, will feature three items of interest: the 'Beaver Watermatic' dishwasher, which weighs only 11lb., and operates simply on pressure of water from the domestic tap; 'Polymats,' multiple mat squares in either polythene or PVC; and 'Sundalets,' a new range of plastic beach sandals made in different colour combinations and sizes.



'Sundalets' beach sandals made in three different sizes and a variety of colours. Barclay-Stewart (Plastics) Ltd.

Industrial Plastics Ltd.—61

Industrial Plastics Ltd., 93 Regent Street, London, W.1, are sole agents and distributors in the UK and/or the Dominions for the following machines: Bandera extruders, PVC and polythene film-blowing equipment; Condux grinders, dicers, disintegrators, lump cutters; Krauss - Maffei mixtruders (twin- and triple-screw) and internal mixers; Decombe automatic coilers; Fluidflow vibratory screeners; Hartig special-purpose extruders; Engelhardt automatic weigh feeders and dosing machines; Previero strand dicers; Pastorello internal mixers and blenders; SCAE electronic film- and bottle-treating equipment and high-speed plastic-bag making machines. Industrial Plastics also design and manufacture themselves ancillary equipment required to complete the production processes required by their customers and they produce, in conjunction with Coste and Chevaleyre, Lyon, France, a complete range of cube dicers, for which they are sole world distributors. These dicers are used for rubber, plastics, linoleum flooring, etc. The ancillary equipment is all manufactured in the UK. Exhibited on the stand will be the following British and foreign machines: extruders, compound extruders, cube dicers, pelletizers, grinders, cable equipment, weighing machines, injection-moulding machines, lump cutters, vibratory screeners, vibratory feeders, take-off equipment, and a selection of automatic vacuum-forming machines, etc.



PVC film-blowing unit suitable for film or layflat tubing up to 24in. width, one thou. thick. Industrial Plastics Ltd.

Cornelius Chemical Co. Ltd.—306

The Cornelius Chemical Co. Ltd., Ibex House, Minories, London, E.C.4, will be exhibiting on behalf of the following companies: Rohm and Haas, Darmstadt ('Plexigum' acrylic injection moulding powders, 'Plexiglas' acrylic sheeting, rod and tube, and 'Plexidur' polyacrylonitrile sheeting, used for manufacturing orthopaedic appliances and also for technical applications in industry. Ancillary products of Rohm and Haas will also be shown, such as their anti-static agents and adhesives); Rezolin Inc. (the Rezolin range of 'Toolplastik' materials, which are compounds specifically designed for plastic tooling applications); General Mills (the 'Versamid' polyamide resins, which are now being produced under licence in the UK); Mearl Corporation ('Nacromer' pearl pigments, which are extensively used by the plastics industry in the UK); Th. Goldschmidt (the various silicones produced by Goldschmidt will be exhibited).

Boston Marine and General Engineering Co. Ltd.—85

Take-off machines will be featured on the stand of the Boston Marine and General Engineering Co. Ltd., Viceroy Works, Low Fields Road, Leeds, 12. These machines are completely versatile and can be used with any extruder. Suitable for all plastics and cable extrusion with any material—rigid, brittle or flexible—all units have infinitely variable-speed control and can be provided with hydraulic or electronic drive.

Interwood Ltd.—16

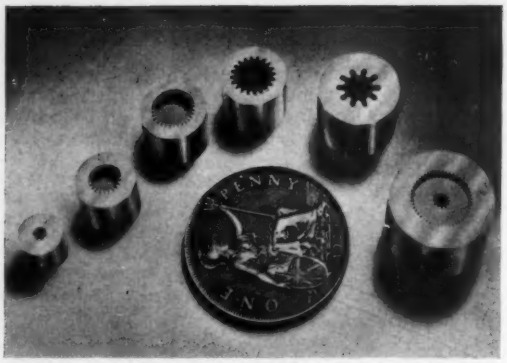
Interwood Ltd., 326 Old Street, London, E.C.1, will exhibit a range of machinery, including: Type FM series trimming and joint-cutting saws designed to give a superlative cutting finish on plastic sheets; type OFN heavy-duty electric high-speed routers for cutting the plastics in a very wide range of shapes and profiles; type HM5 plastic cutting portable edge-trimming tools; type HM portable router for plastics; a full range of presses, hand and hydraulic (heated and cold applications).

Llewellyn Ryland Ltd.—417

The principal exhibit of Llewellyn Ryland Ltd., Balsall Heath Works, Birmingham, 12, will be a polyester-reinforced glass fibre mural demonstrating the use of Ryland colour pastes in polyester glass mouldings; the design was painted on a clear gel coat, which was then backed by two layers of fine surface mat and built up with multiple layers of chopped strand glass fibre.

London and Scandinavian Metallurgical Co. Ltd.—86

The main speciality of the tool division of the London and Scandinavian Metallurgical Co. Ltd., London, S.W.19, is the manufacture of 'Losca' hard nickel electroformed dies for moulds and complete moulds incorporating these cavities, of which they, with their licensees in the US, Germany, France, Spain, Australia, Italy and Israel, are the world's sole producers. By the use of this precision method of manufacture it is possible to effect a large saving in tool costs on intricate dies. An interesting and highly specialized aspect of this company's activities utilizing the electroforming process is the manufacture



Selection of cavities to produce small nylon gears. London and Scandinavian Metallurgical Co. Ltd.

of moulds for making acrylic teeth, where, in addition, the complete equipment is also supplied for this industry. Included in this equipment on show will be a 20ton power-operated hydraulic press representing an advance on the well-known hand-operated model which is still available. Another electroforming application is the manufacture

Amongst those on the stand of the London and Scandinavian Metallurgical Co. Ltd. will be Mr A. E. Thurlow

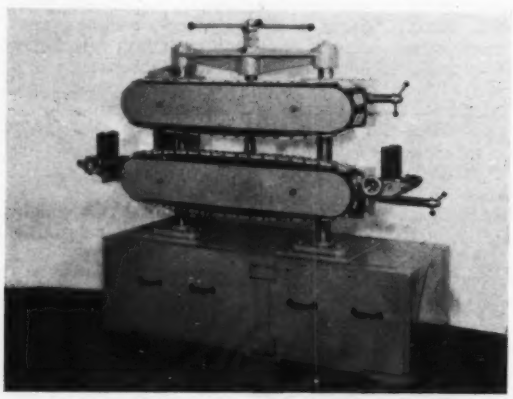
of shells for the slush or rotary casting of PVC, examples of which will be seen.

Lintafoam (Sales) Ltd.—212A

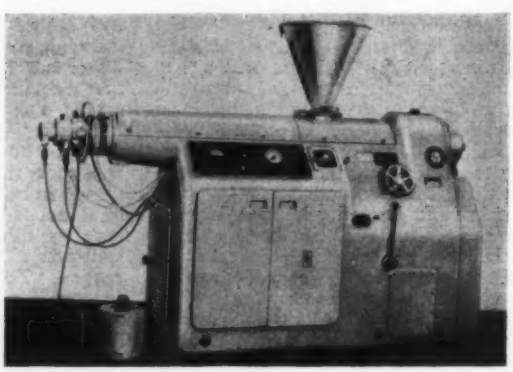
Lintafoam (Sales) Ltd., P.O. Box No. 25, High Wycombe, Bucks, will be exhibiting *inter alia* the following items: Foam edge, polyurethane foam, PVC-covered weatherstrip for wooden- and metal-framed apertures in various sizes ¼in. to 1in. diameter as a draught, dust and heat seal; vacuum-formed PVC and similar material with polyester foam support, moulded to shape for various uses, *e.g.* crash pads for car dashboard panels, arm pads, sun visors, motor-cycle dual seats, overlays and dining chair pads, etc.; flexible polyurethane moulded pipe lagging with PVC cover in various sizes; rigid polyurethane foam for insulating purposes; flexible polyester and polyether in various grades and gauges; flexible polyester and polyether foam in narrow gauge, combined with various types of fabric, *e.g.* car head lining.

International Corporation Ltd. 47 and 50

The International Corporation Ltd., 1 Cornwall Road, London, S.E.1, will occupy four stands on behalf of foreign associates. Products of Hermann Berstorff Maschinenbau - Anstalt GmbH will be a laboratory-type plastics calender, size 17¾in. x 10in.; a heavy-duty plastics extruder with 200mm. dia. screw; a plastics extruder with 90mm. dia. screw; and a model of a full-size plastics calender. On behalf of Maschinenfabrik Stahlkontor Weser GmbH, of Hameln, a demonstration stand incorporating 'Alquist' winding motors will be shown. A caterpillar haul-off machine for use in the electric cable industry will be shown for Johann Leimbach KG, of Wuppertal-Elberfeld, and on behalf of Frieseke and Hoepfner GmbH, of Erlangen-Bruck, a beta - ray thickness gauge with traversing head and an extruder—SP60.



Caterpillar take-off. International Corporation Ltd. on behalf of Maschinenfabrik Johann Leimbach KG, Wuppertal



Extruder SP60. International Corporation Ltd. on behalf of Frieseke and Hoepfner GmbH, Erlangen-Bruck

Kodak Ltd.—231

The special chemicals and plastics sales division of Kodak Ltd., Beech Street, London, E.C.1, which will also be representing Eastman Chemical Products Inc., Kingsport, Tennessee, will show the 'Tenite' moulding powders, including 'Tenite' butyrate, 'Tenite' propionate and 'Tenite' polythene, with a variety of applications illustrating the properties of these materials. 'Epolene' polythene waxes will be displayed and a novel product to be seen for the first time is SAIB (sucrose acetate isobutyrate), which is a modifying extender for film formers. 'Kodapak' sheeting, including cellulose acetate, cellulose triacetate and cellulose acetate butyrate, will be represented and Eastman 910 adhesive, plasticizers, including triethyl phosphate, neopentyl glycol and polymeric plasticizer NP10, will be in evidence.

British Aero Components Ltd.—318 British Aero Components Ltd., Montague Road, Warwick, will display their recently introduced range of nitrided guide pillars and bushes. These pillars and bushes are all in nitrided steel, highly finished to precision limits and available for immediate delivery. A special characteristic of the nitrided case is that the components will retain their hardness through repeated cyclic changes of temperature through a range extending up to 500°C., so that the wear likely to take place through the self-tempering tendencies of the usual steels is virtually eliminated.

CWH new 'skyscraper' research laboratory itself features several plastics materials in floors, hand rails and the outer parapet of the top floor gallery

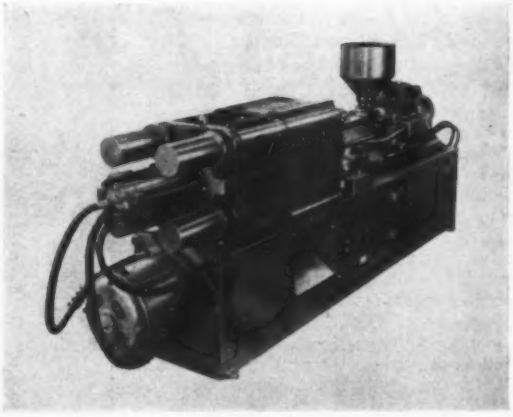
Chemische Werke Hüls—426

The company, which is showing a variety of plastics raw materials, is one of the leaders in the German chemical industry, selling some 600 different chemicals throughout the world. CWH turnover is based largely on plastics raw materials. These include PVC, trade name 'Vestolit'; polystyrene, trade name 'Vestyron.' Incidentally, CWH are probably the largest producers in Continental Europe of styrene monomer. CWH also manufacture Ziegler-type low-pressure polythene, 'Vestolen,' and polypropylene, 'Vestolen P,' will shortly be added to the range. PVC is available in the form of emulsion polymers, suspension polymers, pastes, dispersions and granulates in a number of grades suitable for an immense variety of uses. 'Vestyron' polystyrene can be had in five grades, three of these being crystal clear and the others high-impact and medium-impact modified polystyrenes. The former are in pellets or granules, while the latter two are in granules only. Auxiliary materials, such as plasticizers, solvents, synthetic resins, including polyester resin in liquid form, among them the plasticizers 'Vestinol AH,' 'Vestinol C' and 'Vestinol N,' chlorparaffin and 'Lipinol' and stabilizers VH and MOH are produced. The company has a 50% interest in Buna-werke Hüls' new synthetic rubber plant, which went into production six months ago; 70,000 tons a year of buna rubber are being produced, using the Houdry process.

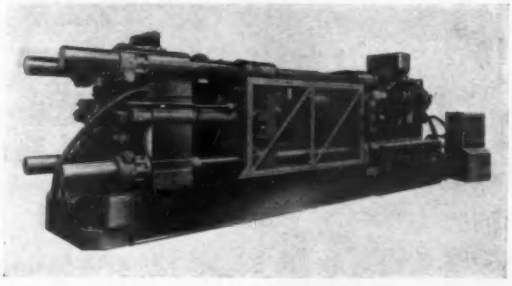
R. H. Windsor Ltd.—36

R. H. Windsor Ltd., Leatherhead Road, Chessington, Surrey, will be exhibiting its range of injection-moulding and extrusion machines embodying the latest features in the thermoplastic field. The AP200 injection-moulding machine, one of the latest additions to the Windsor range, will be shown for the first time. This machine is capable of moulding articles up to 124oz. in polystyrene and is fitted with the Windsor twin-screw two-stage autoplas preplasticizing unit. Another newly designed machine to be shown will be the AP16 single-screw plasticizer. Shown also for the first time will be the W10 fast-cycling 2oz. machine.

On the stand of R. H. Windsor Ltd., *top:* Mr R. E. G. Windsor and Mr P. Windsor, *left:* Mr G. Windsor



The AP16 injection-moulding machine, capable of moulding articles up to 14oz. in polystyrene. R. H. Windsor Ltd.



The AP200 injection-moulding machine can mould articles up to 124oz. in polystyrene. This machine is fitted with the Windsor twin-screw two-stage autoplas preplasticizing unit. R. H. Windsor Ltd.

Other machines will include the W15 fully-automatic 4oz. injection-moulding machine and the 3½in. single-screw extruder. The company, which manufactures injection-moulding machines ranging from 1 to 210oz. capacity and extrusion machines with output up to 400lb. per hour, also produces a comprehensive range of ancillary equipment, precision moulds and dies.

Suntex Safety Glass Industries Ltd.—429

A selection of perspex fabrications, *i.e.* lighting fittings (reflectors and diffusers), scooter screens, medical baths, aircraft windows and panels, food trays, refrigerator panels, ticker tape covers, etc., will be displayed on the stand of Suntex Safety Glass Industries Ltd., Thorney Lane, Iver, Bucks. Also on show will be extruded sections in 'Diakon' and in rigid PVC and extruded reeded acrylic sheet; acrylic tubing, both cast and extruded, clear and coloured.

A glass fibre-reinforced rowing/outboard dinghy, W. and J. Tod Ltd., and Mr N. W. Wright, managing director, who will be on the stand

W. and J. Tod Ltd.—415A

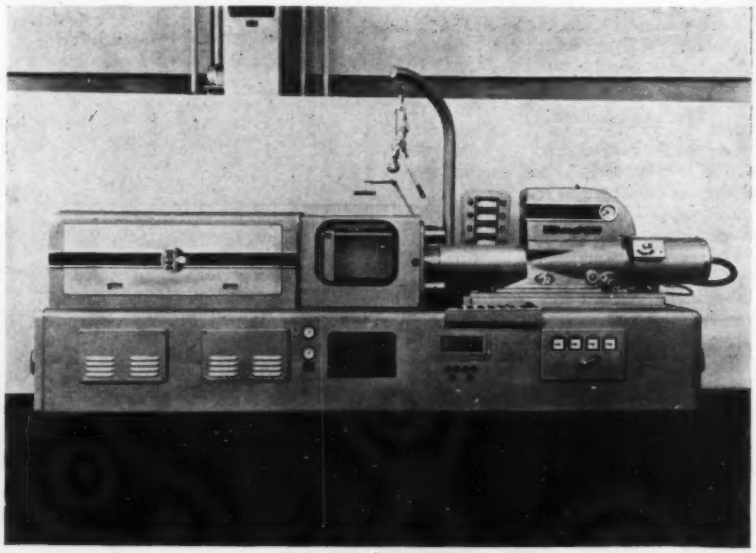
To illustrate the advantages of glass fibre-reinforced plastics, W. and J. Tod Ltd., Ferrybridge, Weymouth, will be showing a number of products in these materials taken from standard production lines. These will include cover, base tray and housings for 'Westair' air conditioners; desk, escutcheon and door for a Marconi radar cabinet; cases and end covers for Stills coffee machines; the casing for a 90h.p. Bedford stationary diesel engine, formed from nine mouldings; and a number of experimental and miscellaneous small mouldings. The company will also be showing its glass fibre 7ft. 6in. rowing/outboard dinghy.

Eckert and Ziegler GmbH—83

Ed. Brand Ltd., Hatton Garden, London, E.C.1, UK representatives of Eckert and Ziegler GmbH, Weissenburg, Bavaria, will be showing three new types of injection-moulding machine manufactured by the German company. These will be the following: the 'Duomat' 200/400S fully-automatic screw-type injection-moulding machine with oil hydraulic pumps and interchangeable injection units; the 'Monomat' 150S fully-automatic screw-type machine, with a shot volume of 9.2cu. in. (the injection unit can be tilted for easy removal of the screw in case of changes of material or colour and special screws or screw heads are provided for different raw materials); and the type EZ100, a new machine with conventional plunger unit, four tie bars and a shot capacity of 3.5oz.

Metropolitan-Vickers Electrical Co. Ltd.—19

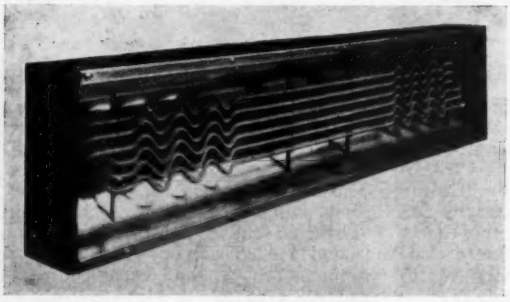
Exhibits of the Metropolitan-Vickers Electrical Co. Ltd., Trafford Park, Manchester, 17, will include various forms of heating equipment as used in the treatment of plastics articles and materials; a vacuum coating unit, with which plastics articles can be coated with a decorative film; squirrel-cage motors; and a display on the irradiation of plastics. The company will also be showing Metrovick induction-heated platens (introduced at this exhibition for the first time) on the stand of T. H. and J. Daniels, who are marketing them in their presses.



The impressive 'Duomat' 200/400S injection-moulding machine. Eckert and Ziegler GmbH

Telegraph Construction and Maintenance Co. Ltd.—211

The Telegraph Construction and Maintenance Co. Ltd., Mercury House, Theobalds Road, London, W.C.1, will be giving a preview of a product which the company will be manufacturing and marketing in the course of a few months. This is sheeting made by extrusion from PVC, toughened polystyrene, polythene of low or high density and other materials, with special applications in vacuum forming and constructional work. There will be a demonstration of dip-coating with 'Telcothene' powder, with special emphasis on the new 'Telcothene HD' (high density), which gives an exceptionally tough and durable anti-corrosive coating. Though specially recommended for utilitarian purposes in industry, it is also available in a range of attractive colours for decorative effect and identification.



A high-intensity infra-red projector with crimped ends to the elements. Metropolitan Vickers Electrical Co. Ltd.

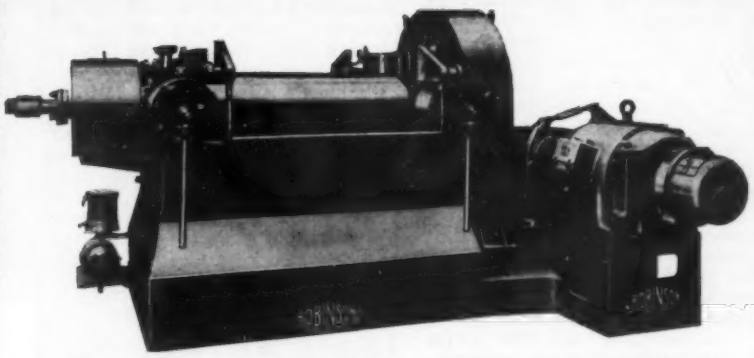
P. B. Cow and Co. Ltd.—23

Products of P. B. Cow and Co. Ltd., 12 Hay Hill, Berkeley Square, London, W.1, will be shown with those of the subsidiary, London Moulders (Plastics) Ltd. The well-known 'Li-Lo' range of plastic inflatables will be featured and will include air-beds, paddling pools, beach balls, rings and wings. The air-beds are in two-ply laminated satin embossed sheeting, approximately 72in. x 72in. inflated, and available in several colours.

Creators Ltd.—335

In addition to its normal range of injection mouldings and extrusions for industry, and electrical accessories in plastic, such as terminal blocks, cable markers, etc., Creators Ltd., Sheerwater, Woking, Surrey, will be laying particular emphasis on a very wide range of decorative extrusions in soft and rigid PVC and cellulose acetate butyrate with metallic foil cores which simulate chromium plate and brass trim. The company will also be introducing a complete new range of products in expanded polystyrene with very wide application. These will include packing applications, acoustic tiles and thermal insulation products.

Specialist Engineers to the Rubber and Plastic Trade



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BIP Tools Ltd.—67

The exhibit of BIP Tools Ltd., Oldbury, Birmingham, will contain examples of injection, compression and transfer moulds to exemplify the wide variety of moulds in which they specialize for the plastics industry. An exhibit featuring Hornby toy trains will demonstrate the extremely fine detail embodied into moulds made for toy rolling stock, and at least one example of the tools for the production of such items will be on view. In addition, the services of this company to the mould-making trade will be exemplified by appropriate exhibits to illustrate thread milling, thread grinding, cold hobbing and the mains frequency-induction heating system.

BIP Chemicals Ltd.—34

BIP Chemicals Ltd., Oldbury, Birmingham, will place emphasis on the superior electrical properties of the amino plastics moulding materials manufactured by the company under the trade names 'Beetle,' 'Scarab' and 'Melmex.' A wide range of electrical components moulded in mineral-filled melamine, paper-filled melamine, wood-filled urea and paper-filled urea will be shown, as will electrical mouldings moulded from DMC polyester dough moulding compound. The international use of these products will be indicated by a selected range of mouldings from overseas. Also to be shown are the advances in the 'Melmex' tableware manufactured from BIP 'Melmex' melamine moulding powder. 'Beetle' resins are also featured with samples showing their wide uses in the textile, paint, paper, laminating and as an adhesive in the woodwork industries. As an example of the wide application of 'Beetle' polyester resins reinforced with glass fibre, the company is showing a marine winker buoy over 5ft. high.

Flexo Plywood Industries Ltd.—204

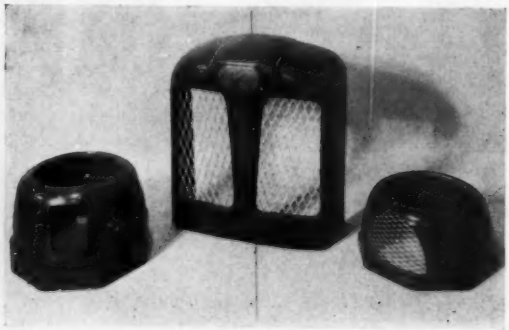
Flexo Plywood Industries Ltd., Flexo Works, Chingford, London, E.4, and its associates, Flexo Plastic Industries Ltd. and The Cork Manufacturing Co. Ltd., Langite Works, Chingford, London, E.4, will be showing various laminated assemblies utilizing glass fibre, 'Durestos,' 'Dufaylite' honeycomb, etc. Special features will be: 'Flexene' picture panels, which are laminated melamine panels for door and wall facings; 'Flexene' decorative melamine laminates as used in the recently completed escalator tunnels at Notting Hill Underground Station; glass fibre - reinforced compression mouldings, such as crash helmets, etc.; decorative glass fibre laminates for translucent panelling; glass fibre-reinforced mouldings for industry and, in particular, the coach-building trade; high- and low-pressure 'Durestos' asbestos phenolic mouldings; the improved plastic-covered 'Chingford' cricket and hockey balls.

'match metal' in polyester glass will be shown in an animated display and a special section will set out to show the entire range of 'Rigidex' polythene applications—packaging, chemical and electrical engineering, ropes, fishing nets and fabrics, etc. The use of 'Rigidex' film in packaging will be given particular emphasis and a great variety of moulded housewares, toys, electrical components and other items will be on view. Another section of the stand will feature the uses of 'Hycar' synthetic rubber—oil seals, gaskets, fuel hose, industrial gloves, adhesives, brake

On the stand of the Distillers Plastics Group—*above, left to right:* **Mr A. E. Oates, publicity officer, Distillers Plastics group; Mr S. R. Badley, market development manager, Distillers; Mr M. S. Welling, press officer, British Geon; Mr S. A. Williams, administration manager sales, British Geon.** *Below:* **Mr S. Mottram, technical service manager, British Geon; Mr R. J. Facer, general sales manager, British Geon; Mr J. D. Winston, general sales manager, British Resin Products Ltd.; and Mr C. D. Harvey-Piper, sales manager, binder resins, British Resin Products**

Distillers Plastics Group—208

Products ranging from kitchen equipment and cars to chemical plant, fishing nets and mine conveyor belting will be featured on the stand of the Distillers Plastics Group—British Geon Ltd. and British Resin Products Ltd., Devonshire House, Piccadilly, London, W.1. The uses of plastics in modern life will be demonstrated with a continuous display of 24 full-colour films, and prominent on the stand will be the all-plastics 'Peerless' car. Guttering linings and de-icing equipment, and of interest to the clothing industry will be a display of 'Hycar'-treated non-woven fabrics.



Radiator cover and commutator end covers for a diesel generator. Flexo Plywood Industries Ltd.

Phoenix Rubber Co. Ltd.—73

Flexible and rigid PVC compounds through the entire range of qualities and prices will be shown by the Phoenix Rubber Co. Ltd., 2k Buckingham Avenue, Trading Estate, Slough, Bucks. Other exhibits will include a comprehensive recovery service for customers' domestically produced thermoplastic waste and automatic equipment for the continuous welding of 'Phenco' flooring and other vinyl floor coverings. The firm's compounds are extensively used by the cable industry, general extruders, calenderers and injection moulders.

Thermo-Plastics Ltd.—81

Thermo-Plastics Ltd., Luton Road Works, Dunstable, Beds, will be showing a selection of signs produced from acrylic and other materials for petrol pumps, etc. A display of sanitary fittings will be included in the exhibit,

Section of swimming pool for marine use in glass-reinforced resins. Thermo-Plastics Ltd.

and other products will be: vacuum-formed articles, injection and compression mouldings, sheet-formed items and a selection of glass-reinforced components. A large division of the company's organization is devoted to this latter work, and fabrications for various industries will be on show to demonstrate different types of manufacture.

Omega Plastics Ltd.—8

A service in injection moulding and vacuum forming is provided by Omega Plastics Ltd., Highbridge Road, Town Quay, Barking, Essex. On display will be injection-moulded components for industry, including nylon gear wheels, high-impact styrene electrical covers and styrene and polythene fancy goods (such as indoor watering cans and floral accessories). Vacuum-formed components for juke boxes, tape recorders, battery insulator covers and cases, deep-relief formed wall panelling (brickwork and tiling) will be on show with the latest development in illuminated ceiling panels and shuttering for the building trade. The company also manufactures advertising display media of high quality and numerous examples of three-dimensional displays and cash tray-counter units will be illustrated.

Microcell Ltd.—203

Microcell Ltd., Ingersoll House, 9 Kingsway, London, W.C.2, will be showing several products, including: Glass fibre containers for 20-man and 25-man life rafts; glass fibre reinforced water tanks; plastic chairs in many colours and of contemporary design; and examples of rocket launchers made of glass fibre reinforced plastics for high performance aircraft.

Spraylat Ltd.—421A

A system for the spraying on to a large range of materials a water-solvent, non-flammable protective coating will be displayed by Spraylat Ltd., 26 Duncan Terrace, Islington, London, N.1. The compounds used are plasticized synthetic resins which can be sprayed on to any surface with conventional spray equipment. When dry, these compounds form extremely tough flexible films that completely protect the surface against physical wear, damage and deterioration. Because they are sprayed on they get into every corner and cling to the most complex configurations. An interesting feature of the films is that, while they adhere to the sprayed article strongly and permanently, they can be simply peeled off when necessary.

Shell Chemical Co. Ltd.—216

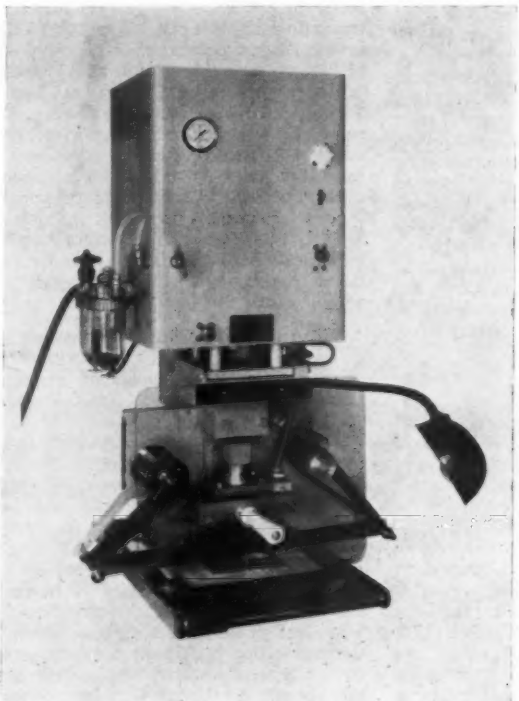
A wide range of modern plastics materials will be on show on the stand of Shell Chemical Co. Ltd., Piccadilly, London, W.1. One of the features will be 'Carlona' polypropylene, a new polymer which was introduced last November. Another thermoplastic with the 'Carlona' trade mark which will be featured is high-density polythene. Shell market a wide range of styrene polymers and copolymers, including basic polystyrene, toughened grades and acrylonitrile copolymers under the name of 'Carinex.' Applications of many of these different grades will be on show, together with examples of what can be done with 'Styrocell' expanded polystyrene (made and marketed by Styrene Products Ltd., a Shell Chemical Co. associate). PVC manufactured by Shell in Holland and marketed in Britain as 'Carina' is another thermoplastic material to be displayed. Examples of rigid PVC pipe, an increasing application of 'Carina,' will be on show, together with many other end-use applications. 'Cariflex' synthetic rubber, whose consistency of quality and colour and extensive grade range makes its use of increasing importance to the rubber industry, will also be exhibited. On the thermosetting resin side the versatility of 'Epikote' epoxy resins will be demonstrated by a wide range of applications, including their use in potting, laminating, tooling, cements, stopping compounds and flooring compositions.

Phillips Bros. and Ellis Ltd.—52

Entirely suited for marking on all plastics, the 'Universal' Mark 1 hot press marking machine manufactured by Phillips Bros. and Ellis Ltd., 11, 12 and 13 Charterhouse Buildings, London, E.C.1, will be featured on the company's stand. The machine, which is fully automatic, is designed to accommodate articles (and jigs) varying in thickness from that of paper to 18in., and it is able to compensate automatically variations of up to 1in. overall thickness. The main advantage of the process is that the mark is made and coloured in a single dry operation.

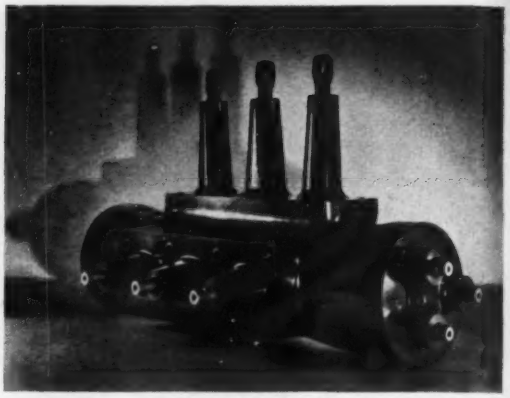
Tintometer Ltd.—94

A display of several types of Lovibond colour-measuring instruments will be featured by Tintometer Ltd., Waterloo Road, Salisbury, Wilts. The Lovibond tintometer, BDH pattern, is the standard type of colour-measuring instrument for liquids and surface colours. The Lovibond Schofield tintometer has



'Universal' Mark 1 hot press marking machine. Phillips Bros. and Ellis Ltd.

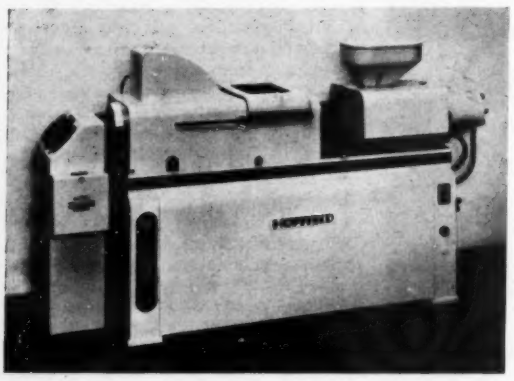
been completely redesigned. Many of these instruments are already in use in the plastics industry throughout the world for measuring the colour of all types of liquid and solid plastic materials. The Lovibond comparator for colorimetric chemical analysis; this simple apparatus is suited to routine analysis in the plastics industry and, in addition to over 150 standard types of colorimetric tests for which discs of glass colour standards are available, there are also special standards applicable only to the plastics industry.



Eleven-kV three-phase busbar unit with dividing box attachment for 'J'-type switchgear. Completely cast in 'Araldite' epoxy resin by CIBA (ARL) Ltd.

Industrie Riunite Sant Antonio SPA—416

A comprehensive range of plain and printed PVC sheeting will be displayed on the stand of Industrie Riunite Sant Antonio SPA, Milan. The company, which manufactures under the trade name 'Santoflex,' has a large selection of floral and modern, etc., designs, many of which it exports to the UK.



Injection-moulding machine. Hupfield Bros. Ltd.

Hupfield Bros. Ltd.—45

A selection of the injection-moulding machines which it manufactures will be on show on the stand of Hupfield Bros. Ltd., The Welsh Harp, Edgware Road, London, N.W.9. Included will be those of 1¼ and 2½oz. capacity, fully and semi-automatic time controlled, and hand-operated hydraulic moulding machines. Completely self-contained with all electrical equipment, these machines are economical to run and simple to operate. Also on display will be the prototype of a pre-plasticizing 4oz. capacity machine. Simplicity, the company states, is the keynote both in design and operation, with resultant low initial and running costs.

Ciba (ARL) Ltd.—302

The range of synthetic resin products manufactured by Ciba (ARL) Ltd., Duxford, Cambridge, will be presented on the company's stand. These will include 'Araldite' epoxy resins, 'Aerolite' urea-formaldehyde resins, 'Aerodux' resorcinol-formaldehyde resins and 'Redux' adhesives. 'Araldite' epoxy resins are available in many different forms. Examples of applications in the electrical industry will include high-voltage insulators, bushings and impregnated and potted transformers. Also on show will be 'Araldite'-faced press tools, cast 'Araldite' foundry patterns and applications of 'Araldite' resins for glass-cloth laminates, protective coatings and adhesives. 'Aerolite' was the first urea-formaldehyde resin glue to be manufactured in Great Britain. Examples will be shown of its use for joining wood to wood, and wood to certain other materials, such as laminated plastics. 'Aerodux' 185 is an extremely durable boiling water-resistant resin and, as well as being an adhesive for wood, is an excellent adhesive for most building materials, including brick, cement, concrete and cement-asbestos. 'Redux' adhesive is used in a patented process for bonding metals, mainly in load-bearing aircraft structures and brake linings in motor vehicles. 'Aeroweb' metal honeycomb provides a valuable material for structures requiring a high strength to weight ratio.

Guyson Industrial Equipment Ltd.—58

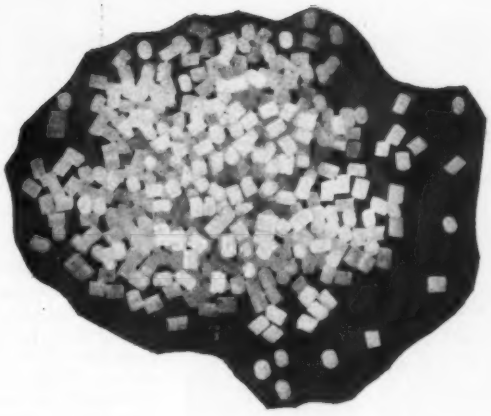
Centrepiece of the display of Guyson Industrial Equipment Ltd., North Avenue, Otley, Yorks, will be the Guyson SBP/40 plastic deflashing machine. Developed for the rapid removal of 'flash' from thermoset plastic mouldings, this machine can also be used, with excellent results, for matfinishing plastic articles prior to painting. A very considerable time reduction in trimming is now possible with this machine and the most intricate mouldings can be treated speedily without damaging the surface in any way, due to the type of abrasive used. Also on display will be the range of Hansen air and fluid line quick-connecting couplings, recently introduced from the US. These fittings are leakproof and have a ball-locking device which gives rapid, smooth action and a very reliable performance.

A. Boake, Roberts and Co. Ltd.—233

The stand of A. Boake, Roberts and Co. Ltd., Carpenters Road, London, E.15, will outline the nature and extent of the products which 'ABRAC' offer to the plastics industry. Plasticizers, including phosphates, phthalates, adipates, sebacates, epoxidized oils and epoxidized esters, will occupy a large proportion of the display area. A novel feature of the stand will be a push-button selector panel which will provide a useful guide to the choice of plasticizers for any specific type of PVC product or process. New developments on show will include ECP 27, a new and economical plasticizer for nitrile rubber, possessing high resistance to extraction by petroleum solvents; the use of epoxidized oils and their derivatives in amine and anhydride-cured epoxy resins for improved resilience and economy; 'Pliabrac 990,' a new low-temperature plasticizer (of low volatility) for PVC.

Amongst staff manning the stand of A. Boake, Roberts and Co. Ltd. will be, *left to right*, Mr P. P. Hopf, products development manager, Mr A. B. Russell, sales manager industrial chemicals division, and Mr G. B. White, deputy sales manager industrial chemicals

Such a plastic granule facilitates subsequent treatment!



That is certain: only an accurately cut plastic granule without fuzz allows economical subsequent treatment, avoiding loss of material. The experienced F&Z cutting machines for strings will help you. See the above illustration: This perfectly cut granule shows clearly the accuracy and uniformity of plastic material cut in an F&Z string cutting machine. Nine different types are available, suiting all requirements. Their well considered design and heavy-duty construction guarantee for a trouble-free reliable running. If you are interested in getting more details as to the special features and the advantages of F&Z string granulators, please write to

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Permali Ltd.—21

Densified wood neutron shielding for atomic power and nuclear energy equipment, a new range of laminated plastic boat fittings and glass fibre marine propellers will be featured by Permali Ltd., Bristol Road, Gloucester. Other

On the stand of Permali Ltd., *left to right*, Mr J. E. Swainson, sales manager, Mr T. H. I. Ison, northern area manager, Mr A. E. Judge, London manager, Mr R. I. Douglas, technical sales engineer

items to be displayed are densified wood laminates; Permali electrical insulation components, general engineering parts and boat fittings; 'Jabroc N' neutron shielding; 'Hydulignum-Jabroc' press tools; 'Aeromaster' adjustable-pitch cooling tower fans; 'Permatred' industrial flooring. 'Permaglass' components and fabrications based on polyester, epoxy, melamine and phenolic resins, illustrating flat sheet, tube, wet lay-up and matched-metal moulding production methods, will be presented, as also will 'Permaflon' (PTFE) components from flat sheet, blocks, tape, cylinders, rods (with and without fillers), moulded or 'coined' forms, dispersion coatings. 'Permacast' epoxy resin HV insulators, encapsulation and chemical parts and 'Dialam' HV bushings and tubes will be shown.

I.C.I. Ltd.—69, 315, 317, 103

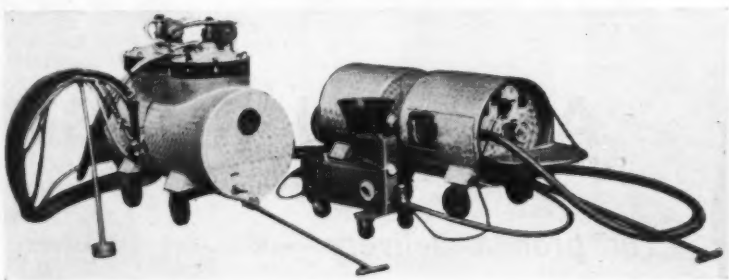
I.C.I. will be well represented. Three Divisions — Plastics, Dyestuffs and Heavy Organic Chemicals—together with subsidiaries Marston Excelsior Ltd. and I.C.I. (Hyde) Ltd. have exhibits. 'I.C.I. Plastics Research and Development' is the theme of the Plastics Division stand (69). A wide range of products will be seen in raw material form. These include 'Propathene,' I.C.I.'s brand of polypropylene, which will shortly be produced in substantial commercial quantities. 'Propathene,' a material which is particularly suitable for moulding, is also likely to be used extensively in film form and as a general extrusion material. The 'Perspex' exhibits will include a bath and basin and a mural on the tower of the stand will incorporate the new colours in the 'Perspex' range, while an exhibit of flat and corrugated 'Perspex' sheet, rod and block will also include a special display of the new colours. Porous filters in 'Fluon' (PTFE) will be seen for the first time, while the use of 'Fluon' for continuous extrusion will also be illustrated. 'Melinex' polyester film finds a new use as a membrane for musical drums, and a drum in which 'Melinex' has been used for this purpose will be on show. Other materials on display will include 'Alkathene' (I.C.I.'s brand of polythene), the 'Butakon' range of butadiene copolymers, 'Darvic' rigid PVC sheet, 'Corvic' and 'Welvic' PVC polymers, copolymers and pastes and 'Flovic' PVC foil. 'Maranyl' nylon moulding and extrusion components, 'Brulon' nylon monofilament and 'Mouldrite' uf powders and resins will also be seen.

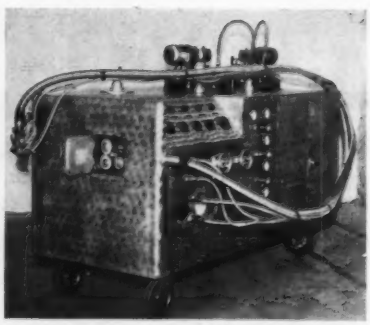
I.C.I. (Hyde) Ltd. (315) will show three products. 'Novon' Ten—a thin, hard, semi-rigid PVC foil which has excellent abrasion resistance and is easy to clean—is designed for lamination to steel and non-ferrous metals. 'Vynalast'—a PVC foil with a paper backing—can be easily laminated to many non-metallic surfaces such as hardboard, plywood, plasterboard and fibreboard. Other products on display will be 'Hydex,' 'Splendex,' 'Vynair,' 'Vynide' and Coventry Panel Trim. The Dyestuffs Division (317) will display polyurethane rigid and flexible foams made from I.C.I. isocyanates and polyesters. The use of polyurethane foams and their suitability for the insulation of refrigerated stores ducting, ships' holds, deckheads and bulkheads will be emphasized. Also on display will be a machine for mixing resins and isocyanates to produce rigid foams, while a film describing how to mix and pour the foams will be shown. Marston Excelsior Ltd. (103) will illustrate examples of glasscloth/epoxy resin fabrication for the 7 GeV Proton Synchroton Project at Harwell will be seen on Marston Excelsior's stand. Industrial fans with laminated plastic blades for process cooling and ventilation in oil, gas and chemical plants will also be on show. Marston Excelsior have acquired the sole manufacturing rights for these fans in the UK from the Hudson Engineering Corporation of Houston, Texas.

The Heavy Organic Chemicals Division will lay particular emphasis on the 'oxo' or carbonylation alcohols made by Heavy Organic Chemicals Division—iso-octanol, 'Alphanol' 79, nonanol and isodecanol—the use of which enables the production of a comprehensive range of phthalate plasticizers with varying properties. Other basic materials of interest to the plastics industry manufactured by the Division are butadiene, para-xylene, phenol, alkylated phenol resin intermediates, and the 'Topanol' range of antioxidants.

Aust and Schüttler and Co.—49

One of the main features of this company's stand is the MAS spraying machine. Using the MAS process, this machine enables cut-glass fibre and resin to be evenly and simultaneously sprayed in any desired proportion, either on or into moulds and forms or on to any other types of surface. The top picture shows model for civil engineering and anti-corrosion work. Lower picture shows the standard model in which the two pressure vessels contain enamelled resin containers, into which the resin mix is fed by a large spiral filling arrangement.





MAS spraying machines for simultaneous deposition of glass fibre and resin. Top picture shows civil engineering model while the standard model is illustrated in the lower picture

On the left-hand side a smaller container is fitted, which serves for the cleaning of the tubing and gun with a solvent. The pressure-reducing valves located at the back regulate the compressed air for the atomization of the resin and for the resin supply to the gun, and for cleaning the tubing and gun. Fibre strands from a coil of rovings are fed to the cutting mechanism, thence to the gun. The final mixing of the resin components only takes place immediately in front of the nozzles, the cut fibres being fed simultaneously; this means that neither the containers nor the tubes can be choked by polymerizing resins. In addition to unsaturated polyester resins, other casting resins, such as phenolic resins, melamine resins, epoxy resins, etc., can be sprayed with this machine.

Mr M. G. Matthews on the stand of Sheridan Croxted Ltd.

Sheridan Croxted Ltd.—106

Three products will be displayed on the stand of Sheridan Croxted Ltd., Lincoln House, 296-302 High Holborn, London, W.C.1. The ' Simco ' static eliminator is an electrical equipment used for the elimination of static charges whilst processing plastic films. Being shown for the first time is the ' Neutrostat ' air gun, an air-cleaning device intended for the neutralization of irregular-shaped plastics and for the removal of specks of dirt and fluff. Typical uses of this equipment are in the cleaning of plastics before offset or screen printing. Another new product developed to overcome the problems of displaying plastics is the ' Croxtine ' anti-static spray. Once plastics are sprayed with ' Croxtine ' no further static dust attraction takes place.

Novadel Ltd.—1

A display of the latest developments on curing polyester resins, including ' Trigonox RM-25 '—diacetyl peroxide—a liquid substituted for benzoyl peroxide; ' Cyclonox R-50 '—cyclohexanone peroxide in liquid form of the standard catalytic strength; ' Cyclonox L-12 '—a solution of cyclohexanone peroxide of an exceptional strength; ' Cyclonox E '—a special type of cyclohexanone peroxide which is suitable for gelling polyester resins even at freezing point of water, will be featured by Novadel Ltd., St. Ann's Crescent, Wandsworth, London, S.W.18.

Mr A. Nutton, director, and Mr C. H. Stoor, chief chemist, of Novadel Ltd.

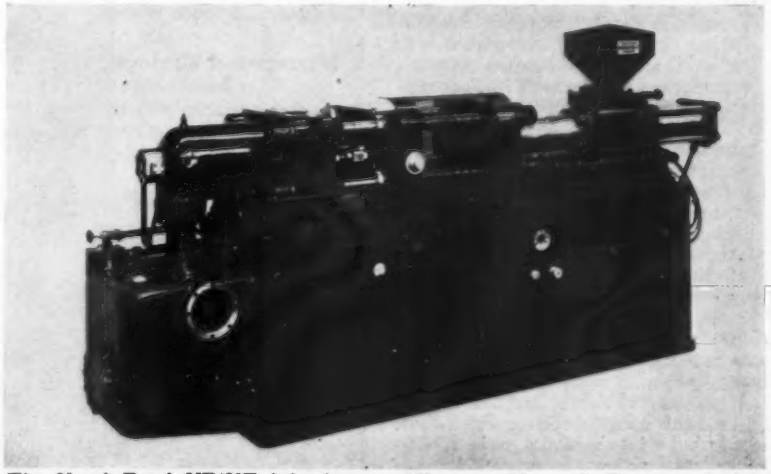
Vinyl Products Ltd. and Vinalex Ltd.—217

The ' Vinamul ' and ' Vinalak ' range of polymers and copolymers in emulsion and solution form, with particular reference to applications in the following industries—paint, textiles, paper, adhesives, glass fibre and polishes—will be featured by Vinyl Products Ltd., Carshalton, Surrey. A special section will be devoted to export and the international nature of the company's activities, the latter being illustrated by the fact that the company's products are manufactured under licence in 14 foreign countries. Vinatex Ltd., Carshalton, Surrey, will show their PVC compounds and colour concentrates which are used for the manufacture of extrusions and injection mouldings. Individual panels will be devoted to compounds for rigid and highly flexible products and to compounds for specialized applications, such as non-toxic tubing, cable insulation and sheathing, and low-pressure injection moulding. The newly developed ' Vinatex ' X and XX grades, which give high-gloss extrusions at low cost, will also be on display. The use of Vinatex PVC colour concentrates will be featured by an animated model illustrating the principle of pigmenting compounds during extrusion. Finished products will be shown which will indicate the use of Vinatex PVC pastes for rotary casting, slush moulding, hot-dip coating and for hot-dip moulding. New developments featured will be Vinatex PVC pastes for rotary casting and for dip coating and moulding which cure to hardnesses of 90° Shore and over.

On the stand of Vinyl Products Ltd. and Vinatex Ltd.—*above*, Mr H. D. Brett, director of Vinatex, Mr R. M. Ringwald, director of Vinatex and export manager of Vinyl Products. *Below*, Mr D. E. Gatfield, assistant sales manager, Vinatex, and Mr J. A. Calman, assistant sales manager, Vinyl Products.

J. Evans and Son (Portsmouth) Ltd.—82

Two moulding machines which are being manufactured in the UK by Negri Bossi (England) Ltd., and three machines which are being brought over by Negri Bossi and C. in Italy for the Exhibition, will be displayed on the stand of J. Evans and Son (Portsmouth) Ltd., Marcyn Works, Goldsmith Avenue, Portsmouth. These will be, respectively, the NB/30 record, the NB/60E, the NBV/60 master extruder, the rapid R3/FA automatic injection moulder and the rapid R12/FA automatic injection moulder. The NB/30 record, first introduced during the 1958



The Negri Bossi NB/60E injection-moulding machine. J. Evans and Son (Portsmouth) Ltd.

On the stand of J. Evans and Son (Portsmouth) Ltd.—Mr L. E. Burrell, sales manager of Negri Bossi (England) Ltd.

international exhibitions, is equipped with a water-cooling system operating on the oil radiator and the compression chamber. Moulds are cooled through two pairs of intakes and outlets for connexion to the water system.

George Ellison Ltd.—18

A selection from the new range of 'EC' Mark II valves for operation by hand, foot, solenoid, hydraulic power, air cylinder or push knob will be introduced by George Ellison Ltd., Perry Barr, Birmingham, 28. The design allows for speedy conversion from one form of operation to another. Features of the new range include standardized components, improved arrangements for positive closing, easy adjustment for wear, a reversible seat to give double

On the stand of Tufnol Ltd.—Mr A. E. Skan, managing director, *above left*, Mr E. J. P. Reynolds, general sales manager, and Mr B. S. Freeland, manager of the London and Home Counties Sales Branch

panels for instrument and control boards, moulded insulators and terminal boards; a number of components showing the numerous uses for 'Tufnol' in the textile industry; and, for general engineering, rolling mill bearings, slipper pads, pulleys and gearwheels. 'Tufnol' can be machined easily and accurately with conventional engineering tools.

On the stand of George Ellison Ltd.—(*l. to r.*) Mr C. E. Sargent, manager of the hydraulic valves division, Mr A. H. Lothian, sales engineer representing the valves division in Scotland and the extreme North of England, Mr L. A. Yardley, sales engineer representing the hydraulic valves division in North and Central England, and Mr B. J. Hersley, sales engineer representing the hydraulic valves division in the South of England and South Wales

life and an easily cleaned exterior, attractive in appearance. The construction is of the simplest form. Each valve unit may be withdrawn from its port as a complete assembly and, with the removal of a single clip, all parts are readily removed without the need for tools in any form. All parts are of non-corrodible materials for use with water or oil. Also on show will be a selection from the range of Ellison screw-down valves.

Tufnol Ltd.—70

A variety of components made of the well-known 'Tufnol' will be exhibited on the stand of Tufnol Ltd., Perry Barr, Birmingham, 22B. These will include stern tube bearings and rudder bearings, illustrating the material's suitability for marine use; gaskets, washers and bolt jackets for pipelines, etc.;

Burtonwood Engineering Co. Ltd.—500

Particular attention will be drawn on the stand of the Burtonwood Engineering Co. Ltd., Burtonwood, Warrington, Lancs, to the 'Helicolor' extruder complete with take-off equipment. The company will be exhibiting in partnership with its principals, Etablissements Andouart, of France. The following items will also be on show: 40mm. Burtonwood-Andouart extruder; 90mm. Burtonwood-Andouart extruder fitted with induction heating; 225mm. compounder; 14in. and 3½in. dicing machines; full range of granulators from Model '0' to Model '35½'; tube cut-off saw; various types of extruder screws; cross heads for cable; straight heads for tubes and profiles.

O. Florin Ltd.—97

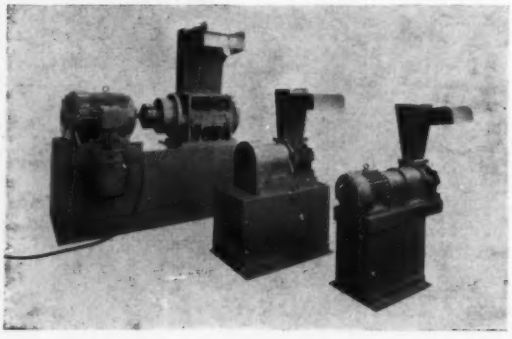
The 'Manumold' range of unit construction injection-moulding presses produced by O. Florin Ltd., 88-90 Holloway Road, London, N.7, will be represented on the company's stand. The range of units and attachments at present available from the company includes the following: a manual in-

On the stand of O. Florin Ltd.—Mr G. H. Florin and Mr B. W. Wallach

jection unit of the rack and pinion type; a hydraulic injection unit, completely self-contained, water cooled, with a 3h.p. motor and remote operation; temperature controllers; water-cooling arrangements; and hopper-dispensers, etc.

Anchor Chemical Co. Ltd.—330

The central feature on the stand of the Anchor Chemical Co. Ltd., Clayton, Manchester, 11, will be a display of 'Cycolac' high-impact thermoplastic resin. 'Cycolac' is the trade mark for ABS (acrylonitrile-butadiene-styrene) polymers manufactured by the Marbon Chemical Division of Borg-Warner and distributed throughout the world, excluding North America, by Anchor Chemical. 'Cycolac' is finding wide application in the US and similar interest is developing in many other



Granulators. *Left to right*, **model 20, model 1/2 and model 0. Burtonwood Engineering Co. Ltd.**

markets. This lightweight, uniform resin is specially suited for the manufacture of any product requiring superior impact strength—even at low temperatures—heat resistance, good electrical properties, hard surface, dimensional stability and chemical resistance. In addition, 'Cycolac' is available in a wide range of colours with a high-gloss finish. Because of the balance of mechanical, electrical and chemical properties, 'Cycolac' offers manufacturers exceptional opportunities for improving the design, construction and appearance of their products with substantial production economies. This thermoplastic resin is readily injection moulded, extruded or vacuum formed.

United Ebonite and Lorival Ltd.—222

A selection of compression mouldings for many branches of light engineering, including washing machine agitators, automobile electrical parts, saucepan and kettle handles and gas meter components, will be featured by United Ebonite and Lorival Ltd., Little Lever, Bolton. Colourful thermoplastic products for refrigerators, batteries, water purification plant and office record systems will be shown and another section of the Lorival stand will display thermoplastic extrusions and calendered sheet. Engineering applications include fire hose lining, electrical conduits and bus bar coverings, cable harness insulation, water and petrol tubing. The insulating properties of sheet and film find uses in tyre tread backings, water tank covers, sack linings and other interesting items. Lorival R and CR rubbers will also be displayed.

Cascelloid Division of British Xylonite Ltd.—218

The well-known range of Cascelloid polythene containers will be represented on the stand of the Cascelloid Division of British Xylonite Ltd., Abbey Lane, Leicester. Apart from being suitable and well proved in the consumer goods field—for pharmaceuticals, etc.—the division's polythene containers can be used for a large range of industrial chemicals. Bottles made in special grades of high-pressure and low-pressure polythene can be supplied in some cases for substances which cannot normally be packed in polythene of melt index 2 and 7. Trade marks, brand names, instructions, etc., can be printed or moulded on to the surface of the container itself. The division also manufactures a range of glass-reinforced plastic mouldings and a variety of lay-flat polythene bags.

Commercial Plastics Group—310/14

The Commercial Plastics Group will be represented by its constituent companies—Commercial Plastics (Sales) Ltd., Anglo-American Plastics Ltd., Iridon Ltd., Greenwich Plastics Ltd. and Fablon Ltd., 73 Grosvenor Street, London, W.1. Commercial Plastics (Sales) Ltd. will show a very wide range of thermoplastic film and sheeting. Further PVC materials will be seen made up into articles such as inflatables, luggage, furniture, etc., all of the most modern design. PVC for gramophone records and recording tapes will be displayed on the Greenwich Plastics section of the exhibit. Polythene film in its many forms will be displayed by Anglo-American Plastics Ltd. Of special interest in this section will be the Lister E-Z bagging machine. Demonstrations will show how polythene lay-flat tubing is made up into a cover for garments. As well as films for packaging—PVC, polythene and the newest material, polypropylene—the Group also supply sheeting for vacuum forming through Iridon Ltd. Applications of polystyrene, unplasticized PVC, low-pressure polythene, rigid PVC and polypropylene will be seen. On view in the Iridon section will be the 'Cubitainer,' which is the latest package for liquids and semi-solids. It is composed of a polythene inner and a cardboard outer and is an economical and easy method of transporting and dispensing liquids.

On the stand of the Geigy Co. Ltd.—*above*, Mr H. Jones, deputy chairman and joint managing director, Mr J. Williams, export manager, *below*, Mr L. R. Dowsett, sales manager plastics chemicals division, and Mr A. Hill, technical manager plastics chemicals division

A selection of polythene containers by the Cascelloid Division of British Xylonite Ltd.

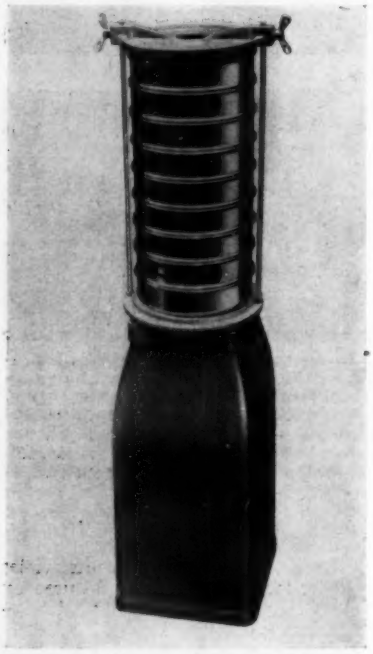
Geigy Co. Ltd.—223

'Tinuvin P,' the new ultra-violet barrier for plastics, will be featured by the Geigy Co. Ltd., Rhodes, Middleton, Manchester. This has recently been introduced to the British market and is expected to find a wide use in all polymeric materials, both plastics and synthetic fibres, which are affected by exposure to light. 'Tinopal PCRP,' an optical whitening agent for plastics, first shown at the 1957 Exhibition and now widely used in formulating plastic compounds, will be included in the display and four new type phthalocyanine blues specially developed for plastics — 'Irgaplast Brilliant Blue BLP,' a red shade type, recommended for those polymeric systems where plasticizers are used, such as PVC, cellulose acetate, etc.; 'Irgalite Fast Brilliant Blue PSB,' recommended for non-plasticized polymers, such as polythene and polystyrene; 'Irgalite Fast Brilliant Blue GLS,' cleaner and greener in shade than conventional standards and suitable for use in polymeric systems; and 'Irgalite Fast Brilliant Blue BGL,' a red shade standard partially solvent stabilized—will be shown. Geigy are manufacturers of a wide range of standard phosphate plasticizers and particular attention is drawn to trixylyl phosphate, the cheapest primary plasticizer for PVC.

Geigy also manufacture many speciality plasticizers, for example, 'Reomol' sebacates and 'Reoplex' polymeric plasticizers. Many new plasticizers are under development.

Endecotts (Filters) Ltd.—49A

Endecotts (Filters) Ltd., Lombard Road, London, S.W.19, will display test sieving equipment as specified by BS and USA Standards for testing, grading and measuring phenol formaldehyde and urea-formaldehyde moulding powders, synthetic resins, shellac, graphite, carbon, ebonite and mica powders, also powders used in the manufacture of polythene, terylene and nylon.



'Endrock' test sieve shaker. Endecotts Ltd.

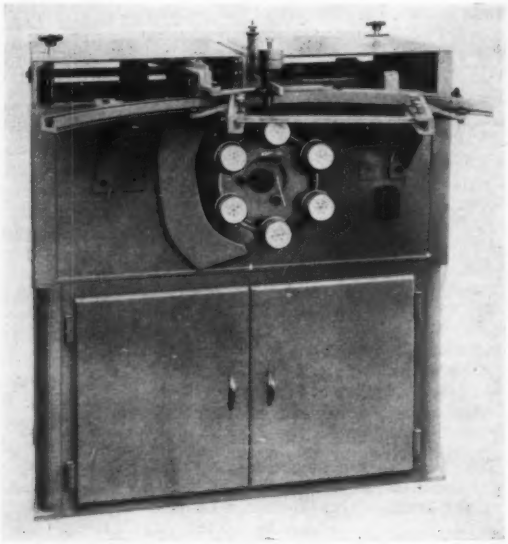
On the stand of Endecotts (Filters) Ltd., M. R. Robbins

Marglass Ltd.—212

The principal exhibits of Marglass Ltd., Sherborne, Dorset, will be a range of chemically-treated glass fabrics and tapes for glass-reinforced plastics. In the display emphasis will be placed on the extent of this field in the plastics industry by including a large number of exhibits showing end uses. Attention will be drawn to the increasing use of leno weave and scrim glass fabrics as base fabrics, improved fabrics for boat building and those used in reinforcing plastic film. In addition, fabrics and tapes made from nylon, terylene and polythene will be displayed.

Dubuit Ltd.—401/2

Dubuit Ltd., 8 Chase Road, Park Royal, London, N.W.10, will be presenting two new automatic and semi-automatic silk screen printing machines for the first time. Machine No. 22A has been specially designed for the large production of cylindrical polythene bottles up to 3⅞in. in diameter. It is fitted with a built-in registration device for multi-colour printing and has a chain-feed mechanism. Attachments can be provided for printing on oval and conical bottles. Its dimensions are 43in. x 36in. x 55in. and it weighs 900lb. Production capacity is up to 3,000 per hour. Machine No. 315 works on the revolving turret principle and is suitable for printing on injection - moulded or vacuum-formed conical containers up to 3⅞in. in diameter.



Semi - automatic silk screen printing machine No. 315. Dubuit Ltd.

Plastic Box Co. Ltd.—419

Containers and plastic mouldings of all types will be displayed on the stand of the Plastic Box Co. Ltd., White Hart Court, Market Rasen, Lincolnshire. Of special interest will be a 'before and after' section showing containers prior to their redesign by the company, with the redesigned packs shown alongside to illustrate the ways in which sales appeal can be incorporated into a product.

Durapipe and Fittings Ltd.—215

Pipes and fittings in thermoplastics, styrene-butadiene acrylonitrile blend, high impact rubber modified PVC, and Ziegler polythene, will be featured on the stand of Durapipe and Fittings Ltd., 56 Kingsway, London, W.C.2.

Utilex Ltd.—28

The full range of materials in clear transparent, coloured transparent and coloured opaque, in gauges from .001in. to .020in., manufactured by Utilex Ltd., Mill Street, Kingston-on-Thames, Surrey, will be displayed on the company's stand. Included will be polished, matted, embossed, metallized and 'glitter' finishes in full-width and slit reels, also sheets. As well as metallized 'Melinex' and 'Cellophane,' a range of rigid containers indicating the decorative effect obtained by the incorporation of colours will be shown.

Bandsaw dispensers in HD polythene. Plastic Box Co. Ltd.

COMPANY MEETING

Dunlop Rubber Company

RECORD TURNOVER

MR G. E. BEHARRELL'S SPEECH

THE 60th annual general meeting of the Dunlop Rubber Company Ltd. was held on June 8 in London.

Mr G. E. Beharrell, chairman of the company, in the course of his speech said:

Since our last Annual General Meeting you will have heard of the passing of my father, Sir George Beharrell, who, as managing director and later as chairman (1937 to 1949), guided the company's affairs from 1923 and particularly during the difficult inter-war years and through the war itself. He was, as you know, no longer a member of our board, having retired in 1957, but, as honorary consultant to the board, he continued his enthusiastic interest in the affairs of the company right up to his last days. I am confident that you would not wish this occasion to pass without the sincerest tribute to his many years of distinguished service and leadership.

The directors' report and accounts have now been in your hands since the middle of May and, as usual, I do not propose to refer to them in detail but instead to mention certain general features of the company's affairs which will be of interest to you.

In 1958 the volume of goods sold by the Group increased by about 7% and turnover by about 5% to a record total of £243 million. Profit margins, however, were adversely affected by price reductions and wage increases which were only partly offset by lower commodity prices. Our earnings also suffered quite a considerable reduction in terms of sterling by the depreciation of local currencies in France and Brazil; otherwise our profit figures would have established a record. On the other hand, a small reduction in our profit before tax has been more than offset by the substantially lower taxation charge under various heads, which are referred to in the Directors' Report. The Group profit after tax is the highest so far achieved.

Following the more realistic profits tax basis introduced in 1958 your Board welcomes the relief given by the Chancellor this year in reducing the standard rate of income tax and reintroducing Investment Allowances. The latter, of course, are of benefit only in the future. We appreciate these taxation reliefs, not only because they help your Company, but also because we hope they mark the beginning of the end of high taxation following the last war and will lead to further expansion of the country's economy.

Activities in United Kingdom

You will have noted from the Directors' Report that, although our turnover in the United Kingdom has shown a satisfactory increase of 7%, the actual profit from the United Kingdom section of our activities was lower than in 1957. This may have surprised many of you in view of the high level of activity of the British motor car industry. Perhaps I might clarify what effect this has on your company. Our sales of car tyres to the British vehicle manufacturers are of great importance to us. Original equipment business, however, in general is highly competitive and margins are low, so the direct contribution to profit, even with the industry itself active, is relatively small. We have established the productive capaci with corresponding overheads to cate. for the greater part of this business in the United Kingdom, and so, whilst profits in times of great activity are not large, losses in times of reduced activity can be serious, as was the case in the year 1956.

It is also appropriate in connexion with 1958 to mention that whilst the motor car industry was buoyant the commercial vehicle and cycle industries were passing through a period of reduced activity. Consequently, on balance, there was little change in our total original equipment business in comparison with 1957.

Expenditure on Research

Before leaving our United Kingdom affairs, and in particular our profit position, there is one further matter to which I would like to refer, namely, the technical and development work which the United Kingdom organization carries out on behalf of the Group. Naturally we receive useful contributions from our overseas subsidiary companies for this work, but these contributions fall far short of the actual cost to the parent Company. I shall speak later of research and development specifically, but it is appropriate at this point to draw your attention to the fact that last year the Group spent almost £2¼ million under this heading. In addition, there were heavy initial production costs in connexion with new products, all of which were borne by the home side of the business.

I have already made references to the effect of changes in exchange rates on profits expressed in sterling, but even allowing for this the overall picture of our overseas activities for the year was most encouraging. Turnover and profit were both higher and a greater proportion of the Group profit was contributed from this source.

Expansion Overseas

You will be aware that Dunlop was to the fore with overseas manufacturing activities in its very early days and then in the 1930's further factories were established.

Since the war all existing overseas factories have increased capacity to a considerable extent and new factories have been opened so that in the last ten years, while modernizing and expanding steadily at home, over 60% of the Group's capital expenditure has been overseas and the profit earned overseas in 1958 was more than three times the figure in 1949 and twice the earnings at home during 1958. Our overall policy is wherever possible to export from our existing factories, but this becomes increasingly difficult in the case of developing countries because of import and exchange restrictions and the understandable desire to establish local manufacture even if sometimes prematurely.

Thus we are frequently faced with a decision either to withdraw from a territory completely or to show our confidence in that territory by establishing a factory there. These decisions are often difficult and must be taken with the greatest care if we are to derive the full benefits from the expanding demand which is arising in every country of the world where the use of motor vehicles is increasing with improving living standards. We believe that a controlled policy of expansion of this kind in overseas markets, notwithstanding its attendant risks, is one which should be pursued by the Company in its own interests and in the interests also of the national economy and the economies of the countries concerned.

Dispersal Policy

The year 1958 has seen our policy in very effective operation in two ways. In France and India we have expanded our existing interests by establishing two new factories, both some distance from our original factories in these two countries. You will appreciate the advantages of this dispersal policy. In Rhodesia, however, we have built a new factory in a rapidly expanding part of

Africa where no tyre factory has previously operated.

Opportunities for overseas expansion also occur where local interests establish a factory with technical aid and trained personnel provided by us. Such is the case in Turkey where an agreement was signed during the year to establish a tyre factory with Turkish capital, British machinery and Dunlop 'know-how.' We also have the right to invest our technical aid fees in shares up to an agreed proportion. A somewhat similar arrangement has been made with an existing firm of general rubber goods manufacturers in Spain.

The rapidly expanding markets of Europe provide a good base for the growth of the Group's five factories in France and Germany, but we regret that no association between the United Kingdom and the European Economic Community has yet been possible. If a Free Trade Area of other European countries can be foreseen and can improve the prospects of agreement with the countries of the Common Market without disadvantage to the Commonwealth it may well be worth pursuing.

Group capital expenditure during 1958 totalled £13 million, £4 million of which was in the United Kingdom and £9 million overseas. The new factories in France, India and Rhodesia largely account for the increased overseas expenditure compared with 1957. The capital expenditure of £4 million in the United Kingdom is still high and it must not be stinted for the sake of overseas interests. It is vital for us to modernize plant and equipment if we are to remain competitive.

Rubber Supplies

I now wish to refer to our natural and synthetic rubber supplies and to the combination of the use of these two important basic raw materials.

In Malaya the progress of our plantations, which I was able to report to you last year, has continued. The emergency is now practically at an end, and in consequence the current replanting programme of 37,300 acres will be completed on schedule in 1962. It is a great tribute to the devotion and tenacity of the staff that 10 years of banditry and terrorism have not been allowed to interfere with the execution of this great programme. Consequently, by 1968 the whole of the Company's 67,000 planted acres will be mature high-yielding rubber.

Our plantations in Nigeria also continue to make good progress. A total area of approximately 10,000 acres of high forest has now been cleared, of which over 8,000 acres have already been planted with high-yielding rubber. At the same time work is proceeding satisfactorily on the permanent building programme which includes houses for workers and staff, roads, bridges and services, offices, hospitals and workshops.

We have also made headway on the small plantation in Brazil which includes an area of clonal rubber now approaching maturity. Here the trees are being cleaned and prepared for early tapping and satisfactory progress is being made.

Synthetic Rubber Plant

The synthetic rubber plant of The International Synthetic Rubber Company at Fawley initiated by your Company and in which we have a substantial interest, is now in efficient production and this country has at last the advantage of a domestic source for the bulk of its synthetic rubber requirements. In addition, a substantial dollar saving is already being obtained for our national balance of payments. It would hover, be a mistake to think that this is a development at the expense of natural rubber. In the expanding field of rubber consumption, there are ample opportunities to use the special qualities of each type of rubber which are complementary rather than alternative and neither can satisfy the total world demand for rubber today. The recent trend of natural rubber prices suggests that, in circumstances of expanding economic activity, a strong demand exists for the available supplies of natural rubber.

The Company also gives constant thought to the ways in which it may be possible to apply to its range of products the growing number of new synthetic materials in addition to rubber which are becoming increasingly available to industry. To this aspect of our use of raw materials the Research Centre at Fort Dunlop is giving very careful attention. There are, for example, the new synthetic materials which are opening up interesting possibilities in upholstery foam manufacture and these are being thoroughly investigated. So much research, however, has been carried out in the rubber industry throughout the civilized world that for any progress to be made in the current period of development it is essential to delve more deeply into the fundamentals of rubber technology. The Company is completely alive to the importance of following such a policy and is therefore directing a substantial portion of its research capacity to fundamental work of this kind.

The next step after research into the development of new materials is the evaluation of the various uses to which those materials can be put. This work is part of the responsibility of the Company's various Development Divisions which work in close liaison with the Research Centre. During the year important development work continued in the adoption of improved compounds for tyres and production facilities were increased for more specialized types of tyres. These included the 'Duraband' which was recently released for general sale following its continued success in competitions and rallies. The development of new products is not, however, in any way limited to the application of new materials, as you will already know from the successful introduction by the Company of such items as the Dunlop Disc Brake. This was developed at our Coventry engineering works and was applied in the first place to aircraft but has more recently been successfully adapted for road vehicles. Another important development arising from our study of engineering problems in connexion with vehicle suspensions has been our 'Pneuride' suspension unit.

In our printed accounts figures are given of the group's profit in relation to the net capital employed, the figure for 1958 being 11.4% compared with 12% in 1957 and 8¼% in 1956. This reduction in 1958 accords with the trend in British industry generally and reflects the more competitive conditions of today.

Nevertheless, in considering these figures it must be borne in mind that the three new factories to which I have referred, together with our investments in The International Synthetic Rubber Co. and our new rubber estates in Nigeria, will take some time to produce a satisfactory return on the substantial amount of invested capital. However, even allowing for this fact, we do not consider our return on capital is high enough and all our efforts both in the United Kingdom and overseas are being directed towards producing a better result by efficiency and economy in the use of capital.

You will no doubt expect me to make some reference to the Group's trading experience since the close of the accounts under review, although, as you know, it is not customary for me to make a prophecy about the current year. I can say, however, that our trading for the first few months has been running at approximately the same level as in the corresponding period of 1958 and in accordance with our expectations.

At the same time I must point out that we are not yet feeling the full effect of the progressive rise in the price of natural rubber which now stands in the region of 30d. per lb. For the future much will depend on the extent to which this increased cost can be recovered or offset by the use of a slightly greater proportion of synthetic rubber; but technical considerations place definite limitations on us.

At this stage you will not expect me to say more than this about the current year's trading but in looking ahead, as we approach the 1960's, one must be impressed at the growing importance of consumer durable goods in the economy and at the expenditure by the people of this country on them as standards of living rise.

I should like, on your behalf, to express appreciation and thanks to all employees — management, staff and operatives—whose combined efforts have contributed so much to the success of the Company during the past year. The accumulated knowledge and experience of all these employees is of inestimable value to the Company.

The report was adopted.

Rubber and Plastics Stock Market

A REVIEW OF PRICES AND TRENDS

OUR list of share prices fully reflects the buoyant tone which has existed throughout the full range of industrial ordinary shares for the past two weeks or so. During this time there has been immense activity on the part of the buyers. Because of the rather antiquated Stock Exchange machinery it is impossible to say whether or not business was at record proportions, but all the indications point to a peak volume. As we go to press, however, the market appears to have established a downward trend, at the moment it seems to be of a very temporary nature but it could develop into something more serious if the existing spate of selling continues unabated. This check in the uptrend has left many of the plastics and rubber shares at below best levels and has certainly pin-pointed the vulnerability of many other more speculative counters. While plastics shares generally have benefited from the market rise they have gained over the course of the past year something approaching 50% of their total market value, shares in several other groups have shown collective gains which approach or exceed 200%.

There can be little doubt that the election will tend to become of more and more importance when assessing the immediate trend of stock markets. This vital imponderable has been pushed into the background by the mood of optimism, but it is an uncertainty which the prices of shares must now take into account. Traditionally the market dislikes uncertainties and more often than not small uncertainties have been too heavily discounted by share prices.

On the shorter term outlook there is obviously the need for greater caution than has been in evidence in the past three months, but on the long term view there is still just cause for optimism and it is this last factor which will tend to check any major slide in the values of leading shares.

One of the more popular top grade issues in the past week or so has been the ordinary of the COURTAULDS group. The full results were well up to expectations and the dividends delighted the optimists. The final payment is 6¾% which brings the total payment for the year up to 9¾% against 8% last time. The group trading profit came out at £13,539,000 which contrasts with £13,918,000 but after a very much lower tax charge of £6,248,000 against £6,980,000, the net figure is £7,290,000 compared with £6,983,000. The directors state that there are now grounds for confidence that the decline in profits reflected in recent years has been checked and that there is good reason for hoping for an improvement in future results.

The ordinary of LAPORTE INDUSTRIES became a weaker market following news of a maintained dividend and a slight fall in profits—both were against the market's hopes. The total pay-out is held at 8% while the net profit after taxation is down by around £42,000 at £1,003,000. At the time of the news the ordinary shares were quoted at around 27s. which put them on a yield basis of only 3% gross. This price obviously over-valued the immediate potential and even the present level of

Share Price Movements

Par Value	Company	1958-59 High	Low	May 30	Latest
5/-	Albright & W. Ord. ..	27/9	13/4½	26/6	27/6
£1	„ „ „ 5% Pref...	16/7½	15/4½	16/3	16/3
5/-	Anchor Chemical Ord...	14/-	10/3	14/-	14/-
5/-	Andersons Rub. Ord. ..	4/3¾	3/-	3/3	3/2½
2/-	Anglo-Amer. Vulc. Fibre Ord.	4/3	2/-	3/3¾	4/-
£1	Angus Geo. Ord. ..	29/10½	21/-	27/3	27/9
5/-	Armitage (Sir Elk.) Ord.	4/10½	2/3	4/6	4/6
5/-	Ault & Wiborg Ord. ..	18/-	11/9	15/10½	17/6
£1	Avon India Rubber Ord.	42/6	27/-	40/-	42/6
£1	„ „ „ 6% Pref.	18/6	17/3	18/3	17/6
10/-	Bakelite Ord.	30/3	17/-	28/-	30/3
£1	„ 6% Pref. ..	19/6	18/3	18/3	18/3
£1	Baker Perkins Ord. ..	47/9	30/7½	47/-	47/6
4/-	Bank Bdg. Rubber Ord.	2/7½	1/6	2/-	2/-
5/-	Boake (A.) Roberts Ord.	18/6	9/-	13/-	13/6
£1	„ „ „ 5% Pref.	15/1½	13/9	13/9	13/9
4/-	Brammer H. Ord. ..	12/9	9/6	11/6†	12/-†
5/-	Bridge, David Ord. ..	28/6	16/3	28/3	28/3
5/-	Bright, John Ord. ..	13/10½	8/9	11/-	11/6
2/-	Brit. Ind. Plas. Ord. ..	8/1½	4/9	7/9	7/9
2/-	„ 10% (tax free) Pref.	5/9	4/8½	4/9	4/6
£1	British Xylonite Ord. ..	57/9	28/6	56/6	56/-
£1	„ „ 5% Pref.	15/9	14/-	15/7½*	15/7½
5/-	BTR Ind. Ord.	13/3	9/4½	10/3¾	10/9
£1	„ „ 7½% Pref. ..	22/6	20/9	22/6	22/6
£1	Courtaulds Ord... ..	38/10½	20/-	36/-	38/9
£1	„ 5% 1st Pref.	18/6¾	15/7½	16/3*	16/3
£1	„ 6% 2nd Pref.	19/6	17/1½	19/6	19/6
4/-	Cow, P. B. Ord. ..	6/7½	3/6	6/-	6/-
£1	„ 5% Pref. ..	14/-	10/9	13/9	14/-
5/-	Dale, John Ord... ..	16/6	10/-	16/3	12/9
£1	„ „ 6% Pref. ..	16/-	13/-	16/-	15/10½
1/-	Dannimac Mfg. Ord. ..	8/4½	2/6	7/6	8/1½
10/-	De La Rue Ord. ..	38/6	20/9	35/10½	38/-
£1	„ „ „ 3½% Pref. ..	11/9	10/-	10/9	10/9
6/8	Distillers Co. Ord. ..	27/-	15/9	27/-	26/10½
£1	„ „ 6% Pref...	21/7½	19/10½	21/6	21/6
£100	„ 5% Conv. Loan	£96½	£91	£93	£93
£100	„ 5½% Unsec. Loan	£94	£87 7/6	£93	£93
10/-	Dunlop Rubber Ord. ..	29/10½	14/9	29/1½	29/9
£1	„ 5½% Pref.	18/9	15/10	17/6	17/6
£100	„ 3½% 1st Debs.	£75½	£67¾	£75	£75½
£100	„ 4½% 2nd Debs.	£82¾	£78	£82½	£82½
4/-	Ebonite Cont. Ord. ..	15/3	7/6	13/9	14/3
£1	English China Clays Ord.	64/-	29/9	62/10½	63/9

Par Value	Company	1958-59 High	Low	May 30	Latest
£1	Goodyear Tyre 4% Pref.	12/9	12/-	12/6	12/6
5/-	Greeff Chem. Ord. ..	20/-	14/-	17/6	20/-
10/-	„ „ 5½% Pref...	8/-	7/9	8/-	8/-
4/-	Greengate & Irwell Ord.	7/0¾	4/9	5/9	5/-
£1	Harrisons & Crosfield Dd.	61/3	43/9	56/3	56/3
1/-	Hunt & Moscrop Ord. ..	1/5	1/1½	1/3	1/4½
£1	Imp. Chem. Ord. ..	38/-	28/3	34/7½	37/1½
£1	„ „ 5% Pref. ..	17/3	16/-	17/-	17/-*
£100	„ 4½% Unsec. Loan	£88¼	£80	£88	£87
£100	„ 5¼% Conv. Loan	£129	£99	£119	£127½*
1/-	Kleemann (O. & M.) Ord.	5/5½	2/6	5/3	5/4½
£1	„ „ 6½% Pref.	16/9	15/-	16/6	16/6*
2/-	Lacrinoid Prod. Ord. ..	2/5½	1/5¾	2/-	2/4½*
5/-	Laporte Ind. Ord. ..	27/6	13/7½	25/3	23/6
£1	„ „ 7½% Pref.	22/10½	21/10½	22/9	22/3
£1	Leyland & Birm. Rubber Ord.	53/9	39/9	51/3	51/3
£1	„ „ 6% Pref.	21/3	16/1½	16/10½	16/9*
2/-	London Rubber ..	19/-	8/6¾	16/10½	18/7½
£1	„ 6% Red. Cum. Pref.	19/9	16/3	18/9	18/9
£1	McKechnie Bros. Ord.	45/-	32/6	41/3	41/3
£1	„ „ 'A' Ord.	44/6	30/-	39/9	38/9
£1	„ „ 6% Cum. Pref.	17/-	16/-	17/-	16/6
5/-	Monsanto Chem. Ord. ..	16/7½	13/-	16/-	16/6
£1	„ „ 3¾% Pref.	13/-	11/-	13/-	13/-
£100	„ 6% Debs.	£104	£101¼	£104	£103*
£1	North British Rubber ..	—	—	15/6	16/-
5/-	Redfern Holdings Ord...	3/7½	2/10½	3/6	3/6
2/-	RFD Ltd. Ord.	6/6	3/5¼	5/6*	5/6
£1	„ „ 5½% Pref. ..	14/9	11/6	14/9	14/9*
2/-	Rubber Imp. Ord. ..	15/6	4/9	5/6	5/6
2/-	„ „ 'A' Ord.	14/3	4/6	5/-	5/-
£1	„ 5% 1st Pref.	12/3	10/-	10/-	10/-
5/-	Rubber Reg. Ord. ..	13/-	10/6	12/6	12/9
4/-	Shaw Francis Ord. ..	20/9	9/9	17/3	20/-*
2/-	Silentbloc Ord. ..	9/2½	7/6	9/-	9/-
2/-	Sussex Rubber Ord. ..	1/11¼	7½	1/9	1/10½
5/-	Sutcliffe Speak Ord. ..	7/4½	5/-	7/-	7/-
£1	Turner & Newall Ord. ..	76/4½	52/-	72/3	71/9*
£1	„ „ 7% Pref.	24/-	22/1½	23/3	23/3
5/-	Universal Asbestos Ord.	21/10½	8/0¾	20/6	21/9
5/-	Viscose Dev. Ord. ..	10/7½	6/3	10/3	10/3
5/-	Warne William (Holdgs.) (Ord.	12/9¾	8/-	12/9	12/9

*Ex-dividend †Ex-all

23s. 6d. would seem to discount a great deal.

The FRANCIS SHAW machinery group is to raise new finance from shareholders. It offers 1,000,000 new 4s. ordinary shares to them at 6s. each in the proportion of one-for-two. The forecast dividend on the increased capital is 17½% which is the same effective rate as that paid a year ago. The 'rights' are exceptionally generous and were well received by the market.

There has been some vague tales circulating the City to the effect that a 'bid' would shortly be made for the BAKELITE group's ordinary capital. The Bakelite directors have acted very swiftly: neither Union Carbide Corporation or its offshoot, Union Carbide, are considering the acquisition of the minority share in Bakelite—so runs the text of the announcement from the board.

LONDON RUBBER ordinary shares have been very prominent of late and the full results justified the optimism. The dividend is to be 40% for the full year against equal to 31¼% last time. Profits rise from £232,000 to £360,000 after taxation of £347,000 against £322,000. There is also a scrip issue on the way in the proportion of one-for-one.

The NATIONAL PLASTICS concern turns in a group net loss for the year to September last of £207,000 which compares with £24,000 last time. There has since been an improvement in the order book position but profits are still slender and Mr A. Duncan, the chairman, says that a still greater volume of sales is required.

The interim dividend of the RUBBER REGENERATING firm is to be held at 5% on the increased capital. Last time the total payment amounted to 15%.

The full report of the O. AND M. KLEEMANN group discloses that in the first four months of the current year turnover has been running at an improved level. Mr D. Kleemann, the chairman, states that although margins have tended to fall there has been some further rise in profits.

UPAM Report

The annual report of the United Planting Association of Malaya for 1958 makes interesting reading. It lists honours and awards gained by members during the year and contains details of councils and committees. It is noted that Mr J. E. S. Crawford was re-elected president in April 1958 and Mr G. H. Lang was re-elected vice-president. The review of the year makes mention of the terrorist activities, the sub-division of estates, research and education.

The section on natural rubber includes a statistical review of production, consumption and prices, and there are seven tables covering these fields together with details of planted acreage, exports and imports.

REVIEW

GUM PLASTICS.—By M. S. Thompson, Naugatuck Chemical Division, US Rubber Co. (Reinbold Publishing Corporation, New York, and Chapman and Hall, London. 193 pages, 36s., by post 38s.)

This is the ninth volume in the Reinbold Plastics Application Series. Like its predecessors it is semi-technical, in the sense that it is aimed at general readers in the plastics industry rather than research chemists. The title may be unfamiliar in this country, but the sub-title 'Rubber Modified Plastics' gives a better indication of its scope.

A brief introduction outlines the history of such materials, the properties that they may be expected to have, and the progress which has been made. It is interesting to note that ebonite ('hard rubber') is regarded as the first gum plastic although this is not consistent with the sub-title of the book.

The general properties of rubber modified plastics are considered next, and as would be expected the three main classes, high impact polystyrene, acrylonitrile - butadiene - styrene polymers and high impact PVC are discussed in some detail. This is followed by an account of the basic chemistry and manufacture of gum plastics. In an effort to meet the requirements of the wide readership it would seem that in this section some clarity has been lost. The distinction between co-polymers having some rubbery characteristics, and blends of rubber and non-rubbery polymers, is insufficiently explained and the diagram on page 57 showing the mechanism of breakage would be regarded by many as an over-simplification.

Methods of fabricating and processing are described in the fourth section and although much of the plant used is the same as for unmodified materials, details are given of the way in which the modified materials may require slightly different treatment in order to produce optimum results.

The final, and by far the longest, section in the book deals with applications of rubber modified plastics and indicates particular fields in which their specialized properties make them of special value.

On the whole the book fulfils its purpose in giving the general reader an introduction to rubber modified plastics, but those with some knowledge of the subject will probably find the over-simplification irksome and the section on applications given undue weight. As with the series generally the standards of production are good, and the book is well illustrated, both with photographs and line diagrams.

∴ Copies may be ordered through the Books Department, RUBBER JOURNAL AND INTERNATIONAL PLASTICS, Maclaren House, 131 Great Suffolk Street, London, S.E.1.

Patent Specifications

The following information is prepared from published Patent Specifications. The full Specifications can be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, at 3s. 6d. per copy (including postage).

Hydrocarbon Polymers

No. 810,210. E. I. du Pont de Nemours and Co. Application and Filed, September 7 1955. Application in USA, September 15, November 22 and 24 1954. Published, March 11 1959.

Normally solid polymers and copolymers of mono-olefins having 4 to 18 carbon atoms in the molecule are prepared by effecting polymerization in the presence of a co-ordination catalyst the prefill system and during the closing ing period the mould opens and the which has been formed by the reaction of a polyvalent metal compound with a metallic reducing agent. Examples of suitable mono-olefins are isobutylene, butene-1, pentene-1, hexene-1, heptene-1 and decene-1. The mono-olefins may be copolymerized with ethylene or propylene. The polymers and copolymers usually have a somewhat rubbery character, and they can be blended with elastomers or other polymers such as polythene. They can be used as thickeners for lubricating oils and some of the polymers can be drawn into oriented fibres.

Shorter Abstracts

Ethylene Copolymers. 807,112. Farbenfabriken Bayer A.G. Filed, September 19 1956. — Ethylene is copolymerized with a vinyl ester, preferably vinyl acetate, in aqueous dispersion, at elevated pressure and at a temperature lower than 100°C. Polymerization is effected in the absence of an emulsifying agent and in the presence of a radical-forming catalyst.

Foam Latex Slab. 807,740. The Firestone Tire and Rubber Co. Filed, September 4 1956.—In apparatus for making foam rubber slab from latex on a conveyor belt, the scraper is cooled in order to hold the temperature of the latex foam in the bank of the feed side considerably below the temperature of the bulk of the latex foam and thus extend the normal gelling time.

PVC Stabilizers. 808,255. The Dow Chemical Co. Filed, April 3 1957.—Thermal stabilizers for PVC comprise dibenzhydryl or di-9-fluorenyl ethers in which any of the substituents on the aromatic carbon atoms are alkyl, alkoxy or halogen.

Tennis Balls. 808,291. Slazengers Ltd. Filed, February 13 1957.—The wall of a tennis ball or similar hollow play-ball is made of microcellular rubber having a specific gravity of 0.6 to 0.9 and a Shore hardness of 63 to 68. The microcellular rubber is based on a blend of 100 parts of natural rubber and 15 to 60 parts of either (a) a resinous butadiene-styrene copolymer of high styrene content, or (b) cyclized natural rubber.

Industry INTELLIGENCE

Technical Data

Estabex 2307

Estabex 2307 is an epoxidized vegetable oil which functions as a plasticizer with stabilizing properties in PVC, chlorinated rubber and nitrocellulose compounds. Data for the properties of Estabex 2307 and results of tests of the material in PVC compositions are given in a pamphlet issued by Novadel Ltd., St. Ann's Crescent, London, S.W.18. When employed as a stabilizer, Estabex 2307 is usually added in an amount not exceeding 5% of the total PVC/plasticizer composition and is generally used in combination with another stabilizer. When Estabex 2307 is used principally as a plasticizer and the final product will not be exposed to excessive heat or strong light, the material may constitute 50% of the plasticizer content. It is a very desirable medium for use in grinding pigments. Examples of PVC products for which Estabex 2307 is suitable include floor and wall coverings, artificial leather, garden hose, cable insulation, baby pants, dipping compositions, conveyor belts, film for packing food products, extruded sections, toys and sheeting for curtains, tablecloths, and rainwear.

Polysar Latex IV in Liquid Floor Polish

Liquid floor polish is a carefully designed aqueous mixture of wax, resin and plasticizer. Experiments on the use of Polysar Latex IV as an ingredient in floor polishes of this kind are described in Polysar Technical Report No. 8:IA, distributed in the UK by Polymer (UK) Ltd., Walbrook House, Walbrook, London, E.C.4. Experimental blends of wax, resin and Polysar Latex IV were tested in the laboratory to determine the optimum latex level. The most promising blends were then used on various types of floors and subjected to normal pedestrian traffic for test periods of up to three weeks. It was found that Polysar Latex IV improved the slip resistance and abrasion resistance of the dried polish film.

Marbon 8000A

Marbon 8000A is a high styrene-butadiene copolymer resin freely compatible with natural rubber, SBR, nitrile rubber and neoprene. A special grade of the resin, Marbon 8000AE, is available for use in electrical applications, this grade being identical in compounding and in reinforcing properties with Marbon 8000A. Information on the compounding procedure and properties imparted to rubbers by the resin is given in Report No. 144/R/59, issued by the Anchor Chemical Co. Ltd., Manchester 11.

Marbon 8000A is an effective plasticizer and improves processing, particularly of synthetic rubbers. With neoprene compounds, sticking to the mill rolls is reduced. It improves the moulding properties of rubber compounds and increases their hot tear resistance. The principal advantages conferred on vulcanized rubbers by Marbon 8000A are hardness and stiffness in compounds of low specific gravity, coupled with excellent abrasion resistance and tear strength. The resin also imports good resistance to light discoloration and weather cracking while Marbon 8000AE gives a product with excellent electrical properties. Uniform cell structure is achieved in cellular compounds. Examples of products in which Marbon 8000A is being used include soles, heels, microcellular soling, hard floor tiling, gaskets, washers, grommets, roll coverings, artificial leather, balls, punching mats, golf ball covers and—specifically Marbon 8000AE—cable insulation and sheathing, electrical plugs and other electrical equipment.

Machines, Materials and Equipment

Plastics Envelopes

The 'Envopak,' a large zip-fastened container made from I.C.I. 'Hydex,' has been developed by Envopak Ltd.,

Fulham Road, London, N.W.6, as a constantly reusable envelope. It is expected to supersede conventional envelopes and canvas bags for many postal tasks. Fully patented and approved by the GPO, the 'Envopak' is tough and waterproof. The hazard of torn and mutilated letters is obviated. Envopaks are available in several different sizes—10in. by 8in. to 16in. by 16in.—and special forms and sizes can be made to specifications.

Portable HF Spark Testers

The Gee-Bee portable spark tester, Model GBP 20, made by Goodburn Plastics Ltd., Arundel Road Trading Estate, Uxbridge, Middx., has been designed to suit conditions in workshops engaged in lining vessels and tanks with rubber, neoprene and plasticized PVC sheet. It is also suitable for outdoor work. The entire housing of this spark tester is moulded in polythene, and the high frequency coil of the instrument is housed in a separate unit which can be plugged into the spark tester by means of a three pin plug. The rear end of the instrument carries a knob with a pointer which allows for the adjustment of the high frequency output. The instrument can be used for 220/230 volts mains and also for 110/115 volts mains. Specifications are: Probe length, 6in.; dimensions, 8in. x 7in. x 3in.; weight, 3lb.; mains, 100/125–220/250 volts; frequency, 20kcs.; power consumption, 30 watts max. The price is £17 ex-works.

Publications Received

Mechanical Handling

A 174-page catalogue, 'Hunter Handling Equipment,' has been issued by G. Hunter (London) Ltd., 80 Fenchurch Street, London, E.C.3. It deals with the whole range of the company's products for the handling of almost every conceivable article likely to be used in industry. Conveyor sizes range from those designed for motor vehicle production lines to those for conveying sausages, and other heavy equipment available includes a comprehensive range of fork lift and industrial trucks. An impressive selection of the smaller requisites for handling are also available — grabs for bar, rod, tube, and slab, etc., crane attachments and chain fittings—to name but a small part.

'Colorcap' Key Control

By means of durable rubber composition caps in contrasting colours, which fit over the ends of keys of any conventional type, a Swiss concern has developed a unique system for the filing and control of keys. This system is known as 'Colorcap.' The key caps hold interchangeable index tabs which correspond with the numbered hooks in specially designed cabinets made to accommodate 50, 140 and 280/300 keys. The various colours can be used to indicate groups, floors, departments, or any other organizational requirement. Complete units are being distributed in this country by Inter-Continental Office Equipment Ltd., Vivian Road, Birmingham 17, from whom full details can be obtained.

Following the acquisition by the Seafield Amalgamated Rubber Co. of a controlling interest in Damansara (Selangor) Rubber Co., Mr J. G. Lawson and Mr L. Grahame have resigned from the board of the latter company.

TRADE MARKS

Objections to the registration of any of the undermentioned applications may be lodged with the Comptroller-General of Patents, Designs and Trade Marks at the Patent Office, 25 Southampton Buildings, Chancery Lane, London, W.C.2, within one month of the date mentioned. The objections must be stated on Trade Marks Form No. 7, cost £2, obtainable through any money order office. The extracts—from 'The Trade Marks Journal'—given below are reproduced by permission of the Controller of H.M. Stationery Office.

HYDROSTEM (B780,787) For bags and flexible containers (in the nature of bags) all made from films of plastics and included in Class 16. By Heafield Industries Ltd., Spa Lane, Derby. (Class 12; April 29 1959.)

(781,717) For synthetic rubber. Anic S.p.A., 181 Via Tritone, Rome, Italy. Address for service is c/o D. Young and Co., 10 Staple Inn, London, W.C.1. (Class 17; April 29 1959.)

ARVINITE (785,623) For plastics and articles made therefrom, all included in Class 17. By A. Arenson Ltd., Arvin Works, Barnet Trading Estate, Park Road, Barnet, Hertfordshire. (Class 17; April 29 1959.)

NETLON (776,541) For nets and netting, all made wholly or substantially wholly of plastics and included in Class 22. By Plastic Textile Accessories Ltd., 25 Richmond Terrace, Blackburn, Lancashire. (Class 22; April 29 1959.)

(784,577) For all goods included in Class 22. By Commercial Plastics Ltd., Willington Quay, Wallsend-on-Tyne, Northumberland. (Class 22; April 29 1959.)

SYNOTEX (771,643) For synthetic resins for use as raw materials in the manufacture of paints and printing inks. By N.V. Chemische Industrie 'Synres,' Slachthuisweg 30 Hoek van Holland, Netherlands. Address for service is c/o Stanley, Popplewell, Francis and Ross, Cursitor House, 9-11 Cursitor Street, London, E.C.4. (Class 1; May 6 1959).

CHIRETTE (781,957) For surgical gloves made of rubber or of plastics. By Byk-Gulden Lomberg Chemische Fabrik Gesellschaft Mit Beschränkter Haftung, Gottlieberstrasse 25, Konstanz, Germany. Address for service is c/o Marks and Clerk, 57-58 Lincoln's Inn Fields, London, W.C.2. (Class 10; May 6 1959).

PATENT LIST

Printed copies of the Specifications in the following list can be obtained from the Patent Office, 25 Southampton Buildings, Chancery Lane, London, W.C.2, price 3s. 6d., including postage, but about six weeks after the date of this publication will usually elapse before they come available. Orders with remittance may be sent in advance to the Patent Office, and will be fulfilled immediately the Specifications are published.

COMPLETE SPECIFICATIONS ACCEPTED

Open to public inspection on June 10 1959

Dunlop Rubber Co. Ltd. Fitting devices for pneumatic tyres. 814,716.

Ferranti Ltd. Preparation of moulds for casting resins. 814,720.

British Cellophane Ltd. Apparatus for forming thin-walled tubes or tubular films of flexible thermoplastic material. 814,723.

United Kingdom Atomic Energy Authority. Cross-linked polystyrene resins. 814,726.

John Bull Rubber Co. Ltd. Containers capable of being nested or stacked. 814,727.

Watercraft Ltd. Synthetic resin-bonded glass fibre structures. 814,804.

B. F. Goodrich Co. Thermoplastic compositions. 814,532.

Badische Anilin- and Soda-Fabrik AG. Production of polymers from olefinically unsaturated hydrocarbons. 814,837.

Badische Anilin- and Soda-Fabrik AG. Production of polymers from olefines. 814,626.

Rubber Journal and International Plastics **CLASSIFIED ADVERTISEMENTS**

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SOUTH AFRICAN importing company, located in Durban, with expanding interests in the supply of ingredients to the rubber, plastics and allied industries has a worthwhile opening for a keen and experienced young salesman, who can furnish evidence of a sound technical training. Knowledge of dyestuffs would be an additional advantage. Applicants who should be 25-35 years of age and preferably single are invited to send full particulars to:—Box 100. (100)

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Please send brief details in confidence, quoting reference LU.1700 to A. Shaw Maclaren. In no circumstances will a candidate's identity be disclosed to the company concerned unless he gives permission after a confidential interview at which he will be given full details of the appointment.

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